Yukon Flats

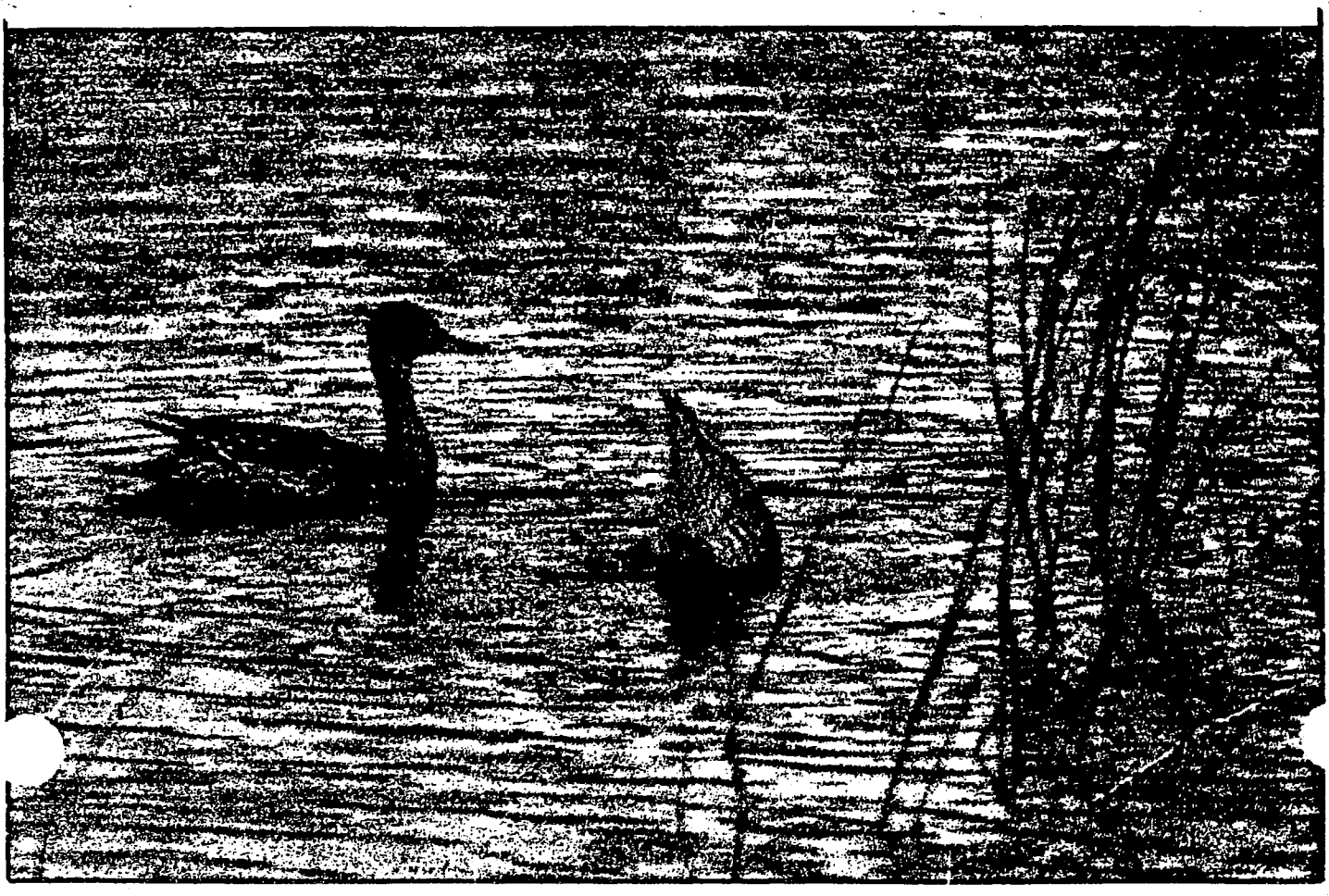
National Wildlife Refuge

FINAL

Comprehensive Conservation Plan

Environmental Impact Statement

Wilderness Review



United States Department of the Interior

FISH AND WILDLIFE SERVICE
1011 E. TUDOR RD.
ANCHORAGE, ALASKA 99503

IN REPLY REFER TO:

PSS-PL/0522K

23 OCT 1987

Dear Reader:

Enclosed is the Final Comprehensive Conservation Plan, Environmental Impact Statement, and Wilderness Review (Plan) for the Yukon Flats National Wildlife Refuge, Alaska. This Plan has been prepared pursuant to Sections 304(g), 1008, and 1317 of the Alaska National Interest Lands Conservation Act of 1980 (Alaska Lands Act), Section 3(d) of the Wilderness Act of 1964, and Section 102(2)(C) of the National Environmental Policy Act of 1969. The Plan describes five alternative strategies for long-term management of the Yukon Flats Refuge.

When producing long-term management plans for the nation's national wildlife refuges, the U.S. Fish and Wildlife Service (Service) actively seeks comments from the general public on the development of management alternatives and on the choice of a preferred management strategy. The management of national wildlife refuges in Alaska must conform to the legal and administrative requirements listed in the first section of this document. Requirements that have a direct impact on the development of the long-range plan and on the choice of the preferred management alternative are discussed below.

According to the National Wildlife Refuge System Administration Act and Section 304(b) of the Alaska Lands Act, no use of a national wildlife refuge will be permitted unless it is first determined to be compatible with the purposes for which the refuge was established. Section 304(g) of the Alaska Lands Act requires the preparation of a comprehensive conservation plan such as this for each unit of the National Wildlife Refuge System established or enlarged by the Alaska Lands Act. The Yukon Flats Refuge Plan designates areas within the refuge according to their resources and values, outlines programs for conserving fish and wildlife resource values, and specifies uses within each area that may be compatible with the major purposes of the refuge. In addition, the Plan discusses opportunities that will be made available for fish and wildlife oriented recreation, ecological research, environmental education and interpretation, and economic use of refuge lands.

In addition to presenting the Service's long-range management strategies for the Yukon Flats Refuge, this Plan evaluates the effect of the proposed management alternatives on subsistence uses and needs, as required by Section 810 of the Alaska Lands Act. The law requires the Service to give adequate notice and hold public hearings before implementing any part of the Plan determined to have an effect on subsistence. These requirements are met by: (1) public hearings held in conjunction with the development of this Plan; (2) the Section 810 evaluation found as part of the text; and (3) the consideration of comments received.

Section 1008(a) of the Alaska Lands Act directs the Secretary of the Interior to establish an oil and gas leasing program on federal lands in Alaska except where prohibited by law or on those units of the National Wildlife Refuge System where oil and gas development would be incompatible with refuge purposes. Through the planning process with its opportunity for public review, the Service is trying to determine to what extent oil and gas development should be permitted. The Secretary also must consult with the Secretary of Energy to determine the national interest in developing oil and gas on refuge lands. His finding could influence the establishment of an oil and gas program. In addition, consultations must be held with the Governor, local governments, Native village and regional corporations, the Alaska Land Use Council, representatives of the oil and gas industry, conservation groups, and other interested individuals to determine the public interest in or opposition to oil and gas exploration and leasing activities.

During the process of developing plans, the public has an opportunity to suggest what additional lands, if any, should be placed in the National Wilderness Preservation System. Section 1317 of the Alaska Lands Act requires the Service to review all lands in the National Wildlife Refuge System in Alaska not Congressionally designated as wilderness to determine their suitability or nonsuitability as wilderness and to subsequently recommend areas for inclusion in the National Wilderness Preservation System.

Although large tracts of land in refuges in Alaska may be found to be suitable as wilderness, not all suitable land will be proposed for wilderness designation because of management strategies that will be used to meet refuge purposes. As a result, the range of wilderness alternatives is evaluated subsequent to the Service's selection of its preferred management alternative. Two wilderness proposals are examined in the Plan for the Yukon Flats Refuge. The preferred alternative identified in this Plan includes a proposal to recommend eight percent of the refuge for wilderness designation.

With the passage of the Alaska Lands Act, Congress established more than 19 million acres of Wilderness on refuges in Alaska. Therefore, the criteria used to determine what land the Service additionally proposes for wilderness

designation include (1) the need for wilderness unit boundary adjustments and (2) the addition of selected areas with outstanding resource values that may have been inadvertently overlooked during the original wilderness review and subsequent designations undertaken by Congress. A summary of public comments on the Service's recommended wilderness proposal will be included in the final plan which is part of the wilderness package sent to Congress.

Comments provided on the draft plan have been taken into account in preparation of this Plan. A record of decision will be published no sooner than 30 days following the publication of the document, and the Service will begin implementing the management directions in the preferred alternative.

Requests for further information should be directed to the Regional Director, U.S. Fish and Wildlife Service, 1011 E. Tudor Road, Anchorage, Alaska 99503, Attention: Bill Knauer or contact Mr. Knauer at (907) 786-3399.

Sincerely,

Walter O. Stieglitz

Regional Director

Enclosure

YUKON FLATS NATIONAL WILDLIFE REFUGE
COMPREHENSIVE CONSERVATION PLAN,
ENVIRONMENTAL IMPACT STATEMENT,
AND
WILDERNESS REVIEW

FINAL

October 1987

U.S. FISH AND WILDLIFE SERVICE
REGION 7
1011 EAST TUDOR ROAD
ANCHORAGE, ALASKA 99503

The Yukon Flats National Wildlife Refuge, created in 1980 by an act of Congress, lies approximately 150 miles north of the City of Fairbanks in interior Alaska. This final comprehensive conservation plan and environmental impact statement describes five alternatives for managing the Yukon Flats Refuge and analyzes the effects of implementing each alternative. An alternative reflecting current management is included as one of the management strategies. The U.S. Fish and Wildlife Service's preferred alternative is identified and the criteria used in its selection are presented. The plan also includes a wilderness review, which evaluates the suitability of lands for wilderness designation under each management alternative.

For further information contact William W. Knauer at the above address or by calling (907) 786-3399.

ANILCA REQUIREMENTS

Section 304(g) of ANILCA requires the preparation of a comprehensive conservation plan (CCP) for each unit of the National Wildlife Refuge System established or enlarged by ANILCA. These plans are to designate areas within the refuge according to their respective resources and values, specify the programs for conserving fish and wildlife resource values and specify the uses within each area which may be compatible with the major purposes of the refuge. The plan will also set forth those opportunities which will be provided within the refuge for fish and wildlife-oriented recreation, ecological research, environmental education and interpretation of refuge resources and values, and economic use.

FISH AND WILDLIFE PLANNING DOCUMENTS

The Fish and Wildlife Service planning process for each refuge involves a number of stages progressing from the development of a broad comprehensive conservation plan/environmental impact statement/wilderness review to the formulation of detailed management plans for implementing specific components of the CCP.

The CCP addressed topics of resource management, visitor use, refuge operations, and development in general terms. The wilderness review determines which lands are suitable for inclusion in the National Wilderness Preservation System. The goal of this plan is to establish a consensus between the Service and interested agencies, groups, and individuals about the types and levels of visitor use, development, and resource protection that will occur. These decisions are based on the purposes of the refuge, its significant values, the activities occurring there now, and the resolution of any major issues surrounding possible land use conflicts within and adjacent to the refuge. The following kinds of detailed management plans are prepared after completion of the CCP.

Refuge management plans identify the actions that will be taken to preserve and protect natural and cultural resources. Examples include a fishery management plan, a wildlife habitat management plan, a fire management plan, and a public use management plan.

Annual work plans identify specific tasks or projects to be completed in the current year to implement the detailed management plans.

Public involvement and cooperative planning efforts are continued through the completion of the detailed management plans.

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TABLE OF CONTENTS

	PAGE
Table of Contents	iii
Table of Contents for Wilderness	vi
List of Tables	vii
List of Figures	viii
SUMMARY	ix
I. INTRODUCTION	1
Purpose and Need for the Action	1
Historical Overview	1
Purposes of the Yukon Flats Refuge	2
Legal Context	2
Planning Process	7
II. IDENTIFICATION OF ISSUES	11
Public Involvement	11
Public Concerns	11
Additional Issues Identified During the Planning Process	14
State of Alaska Position Paper	14
Management Concerns	15
Identification of Significant Planning and Wilderness Issues	21
Significant Issues	33
Public Review of the Draft Plan	33
Revision of the Draft Plan	34
III. SPECIAL VALUES	37
IV. AFFECTED ENVIRONMENT	39
Land Status	39
Physical Environment	42
Climate	42
Topography	43
Geology	44
Soils	48
Minerals	50
Water Resources	55
Biological Environment	59
Vegetation and Land Cover Types	59
Wildlife	67
Fish	77
Human Environment	81
History	81
Population and Settlement Patterns	83
Sociocultural Systems	85
Community Infrastructure	86
Economic Conditions	86
Subsistence	87
Access and Transportation	97
Recreational Use	101
Economic Use	102
Wild and Scenic Rivers	104
Wilderness Qualities	104

PAGE

V. MANAGEMENT ALTERNATIVES 115
Management Categories 115
Intensive Management 115
Moderate Management 116
Minimal Management 116
Designated Wilderness 116
Management of the Beaver Creek National Wild River Corridor 116
Management of Selected Lands 124
Management Directions Common to All Alternatives 124
Management Emergencies 124
Mitigation 124
Cooperation and Coordination with Other Government Agencies 125
Cooperation with Inholders and Owners of Adjacent Lands 125
Access to Inholdings 126
Land Exchanges and Acquisition 126
Resource Management 127
Data Collection and Research 127
Wildlife Management 127
Fisheries Management 129
Water Quality 130
Water Rights 131
Air Quality 131
Shorelands, Tidelands, and Submerged Lands 131
Management of Watercolumns 132
Visual Resource Management 132
Cultural/Historical Resources 132
Fire Management 133
Subsistence Use Management 133
Access and Transportation 134
Section 1110(a) Access Requirements 134
Section 1110(b) Access Requirements 135
RS 2477 Rights-of-Way 135
Section 17(b) Easements 135
Non-Exclusive Use Easements 136
Dalton Highway Corridor 136
Public Use 137
Recreational Use 137
Education/Interpretation 137
Cabin Management 137
Litter and Waste Control 138
Economic Use Management 138
Alaska Mineral Resource Assessment Program 138
Oil and Gas Exploration and Development 138
Locatable Hardrock Minerals 139
Coal and Geothermal Resources 140
Transportation and Utility Systems 140
Other Economic Uses 140
Wilderness Suitability 141
Wild and Scenic River Management 141
Administrative and Visitor Facilities and Services 142
Refuge Management Plans 142

PAGE

Description of the Alternatives 143
Alternative A (Current Situation) 143
Alternative B 150
Alternative C 156
Alternative D (Preferred Alternative) 162
Alternative E 169
Other Alternatives Considered 175

VI. ENVIRONMENTAL CONSEQUENCES 177
Alternative A 178
Scenarios 178
Biological Effects 181
Socioeconomic Effects 184
Wilderness Designation Effects 187
Alternative B 190
Scenarios 190
Biological Effects 196
Socioeconomic Effects 204
Wilderness Designation Effects 209
Alternative C 215
Scenarios 215
Biological Effects 216
Socioeconomic Effects 220
Wilderness Designation Effects 224
Alternative D 229
Scenarios 229
Biological Effects 230
Socioeconomic Effects 231
Wilderness Designation Effects 234
Alternative E 239
Scenarios 239
Biological Effects 240
Socioeconomic Effects 242
Wilderness Designation Effects 244
Mitigation 247
Short-term Use Versus Long-term Productivity 247
Irreversible and Irretrievable Commitment of Resources 248

VII. EVALUATION OF THE ALTERNATIVES 249
Evaluation Criteria 249
Relative Costs of the Alternatives 260
Selection of the Preferred Alternative 261

APPENDICES 263
A. List of Preparers 263
B. Consultation and Coordination 264
C. Bibliography 268
D. Birds of the Yukon Flats National Wildlife Refuge 280
E. Mammals of the Yukon Flats National Wildlife Refuge 289
F. Fisheries Resources 291
G. International Treaties 295

Page

H. Master Memorandum of Understanding between the Alaska Department of Fish and Game and the U.S. Fish and Wildlife Service, Department of the Interior 297
I. Memorandum of Understanding between the U.S.Department of the Interior, the U.S. Department of Agriculture, and the State of Alaska Governing the Conduct of Uplands Mineral Leasing and Lands Disposal on Lands Outside the North Slope of Alaska 300
J. Potential State of Alaska Revised Statute (RS) 2477 Rights-of-Way 306
K. Comments on the Draft Yukon Flats Refuge CCP/EIS and Fish and Wildlife Service Responses 308

TABLE OF CONTENTS FOR WILDERNESS

Identification of Significant Wilderness Issues 21
Significant Issues 33
Wilderness Qualities 104
Background and Legal Requirements 104
Criteria for Wilderness Review and Evaluation 104
Evaluation of Wilderness Review Units 105
Wilderness Management Category Description 116
Common Management Direction: Wilderness Suitability 141
Alternatives 143
Wilderness Review and Proposal for Alternative A 148
Wilderness Review and Proposal for Alternative B 155
Wilderness Review and Proposal for Alternative C 161
Wilderness Review and Proposal for Alternative D 167
Wilderness Review and Proposal for Alternative E 174
Environmental Consequences 177
Scenarios for Alternative A 178
Wilderness Designation Effects of Alternative A 187
Scenarios for Alternative B 190
Wilderness Designation Effects of Alternative B 209
Scenarios for Alternative C 215
Wilderness Designation Effects of Alternative C 224
Scenarios for Alternative D 229
Wilderness Designation Effects of Alternative D 234
Scenarios for Alternative E 239
Wilderness Designation Effects of Alternative E 244
Evaluation of the Alternatives 249
Summary of the effects of the alternative wilderness proposals on the significant wilderness issues, Yukon Flats Refuge 258

LIST OF TABLES

NUMBER		PAGE
1	Major issues and concerns identified for the Yukon Yukon Flats Refuge	22
2	Analysis of public comments on the draft plan	35
3	Land status within the Yukon Flats Refuge, October, 1984	40
4	Acreage summary of land cover classes on the Yukon Flats Refuge	61
5	Description of cover types mapped on Yukon Flats Refuge	62
6	Alaska waterfowl breeding population survey, Stratum 4, Yukon Flats Refuge	68
7	Numbers and acreage of lakes and ponds on the Yukon Flats Refuge	70
8	Dall sheep population and composition data	73
9	Yukon River subsistence salmon catch, Yukon Flats villages	77
10	Escapement surveys completed on the Yukon Flats Refuge	79
11	Population trends of communities near Yukon Flats Refuge, 1960-1980	84
12	Commercial fisheries entry permits, Yukon Flats area, 1982	103
13	Public uses and facilities, economic uses, access, and resource management activities compatible with management policies in each category	117
14	Acreage distribution by management category - Alternative A	143
15	Acreage distribution by management category - Alternative B	150
16	Acreage distribution by management category - Alternative C	158
17	Acreage distribution by management category - Alternative D	163
18	Acreage distribution by management category - Alternative E	171
19	Comparison of the alternatives, Yukon Flats Refuge	176
20	Evaluation of alternatives based on refuge purposes	250
21	Summary of the biological and socioeconomic impacts resulting from the five alternative, Yukon Flats Refuge	252
22	Summary of the effects of the alternative wilderness proposals on the significant wilderness issues, Yukon Flats Refuge	258
23	Evaluation of alternatives based on issues	259

LIST OF FIGURES

NUMBER		PAGE
1	National wildlife refuges in Alaska	3
2	Location of the Yukon Flats Refuge	4
3	The planning process	9
4	Land status, Yukon Flats Refuge	41
5	Geology of the Yukon Flats Refuge	46
6	Soils suitable for agricultural development	49
7	Yukon Flats oil and gas potential, known coal outcrops, and active mining claims	51
8	Watersheds on the Yukon Flats Refuge	57
9	Land cover classes - forests	63
10	Land cover classes - scrub/forest	64
11	Land cover classes - scrub	65
12	Land cover classes - water/wetlands	66
13	Drake densities per square mile on the refuge, mid-sixties	69
14	State game management units, Yukon Flats area	72
15	Dall sheep distribution on the Yukon Flats Refuge	74
16	Caribou use areas, Yukon Flats Refuge	76
17	Regional distribution of subsistence activities	89
18	Distribution of subsistence activities - Birch Creek and Chalkyitsik	90
19	Distribution of subsistence activities - Fort Yukon and Stevens Village	92
20	Distribution of subsistence activities - Venetie and Circle	94
21	Distribution of subsistence activities - Beaver and Arctic Village	96
22	Annual cycle of subsistence activities, Yukon Flats Refuge	98
23	Major air and overland access on the Yukon Flats Refuge and public access (17(b)) easements	99
24	Wilderness review units, Yukon Flats Refuge	106
25	Alternative A (the Current Situation)	144
26	Alternative B	151
27	Alternative C	157
28	Alternative D (the Preferred Alternative)	164
29	Alternative E	170
30	Relative cost of implementing the alternatives based on operations and maintenance budget, Yukon Flats Refuge	260

SUMMARY

SUMMARY

This document is the final comprehensive conservation plan, environmental impact statement, and wilderness review (CCP/EIS/WR) for the Yukon Flats National Wildlife Refuge. It describes five alternatives for managing the refuge and identifies the possible consequences of implementing these alternatives. Each alternative provides broad policy guidance for managing the refuge. Each alternative also identifies lands suitable for wilderness designation.

The Yukon Flats Refuge encompasses approximately 8,480,000 acres of federal lands and an additional 2,696,000 acres of selected and conveyed lands in east central Alaska. Extending 220 miles east-west along the Arctic Circle, the refuge lies between the Brooks Range (to the north) and the White-Crazy Mountains (to the south). The Trans-Alaska pipeline corridor runs along the refuge's western boundary while the eastern boundary extends to within 30 miles of the Canadian border. The Yukon River bisects the refuge, creating the dominant terrain features of the refuge. The refuge is roughly divided into three physiographic zones: riparian and wetlands (48 percent of the refuge); uplands (29 percent of the refuge); and mountains (23 percent of the refuge). Water, in the form of lakes, ponds, sloughs, and streams, is a dominant feature of the refuge landscape. A total of 147 bird, 39 mammal, and 24 fish species occur or potentially occur on the refuge.

Congress established the Yukon Flats Refuge in 1980 when it enacted the Alaska National Interest Lands Conservation Act (ANILCA). Section 302(9)(B) of ANILCA sets forth the following major purposes for which the Yukon Flats Refuge was established and shall be managed:

> (i) to conserve fish and wildlife populations and habitats in their natural diversity including, but not limited to, canvasbacks and other migratory birds, Dall sheep, bears, moose, wolves, wolverines and other furbearers, caribou (including participation in coordinated ecological studies and management of the Porcupine and Fortymile caribou herds) and salmon;
>
> (ii) to fulfill the international treaty obligations of the United States with respect to fish and wildlife and their habitats;
>
> (iii) to provide, in a manner consistent with the purposes set forth in subparagraphs (i) and (ii), the opportunity for continued subsistence uses by local residents; and
>
> (iv) to ensure, to the maximum extent practicable and in a manner consistent with the purposes set forth in paragraph (i), water quality and necessary water quantity within the refuge.

PLANNING PROCESS

The first step in developing a comprehensive conservation plan for the Yukon Flats Refuge was to collect information. Field inventories, remote sensing, and literature searches produced information about refuge resources

and uses. Public meetings, workshops, and other means were used to learn of what people were concerned and what they felt should be done on the refuge. All available information was then analyzed with the help of resource specialists from several agencies and the private sector, to identify special values, problems, and issues as required by ANILCA.

Special values of the refuge which were identified during the planning Process include: the White Mountains, the Yukon River and its tributaries, the Yukon Flats, the Black River country and its lynx habitat, and the overall size and configuration of the refuge which includes several entire watersheds.

Seven potential problems affecting fish and wildlife resources were identified for the Yukon Flats Refuge: development and use of extensive refuge inholdings; development and use of lands adjacent to the refuge; the lack of data on wildlife populations, habitats, and their uses; fire suppression and its effects on fish and wildlife habitats; water pollution problems on Birch Creek; management of migratory fish populations; and difficulties in managing the refuge with current staffing and funding levels.

Issues of concern to the public included: access and transportation; trapping; hunting and fishing on the refuge; management of refuge habitats; predator control; fire and its impacts on wildlife; the need for cabins; cutting of trees for various uses; wilderness designation of refuge lands; recreational use of the refuge; private inholdings; mining and its effects on the refuge; oil and gas development; and management of the refuge.

Public Comments on the Draft CCP/EIS

The Draft Yukon Flats Comprehensive Conservation Plan/Environmental Impact Statement (CCP/EIS) was made available for public review and comment early in September, 1985. A ninety day review was established. Following a restatement of the Service's policy on oil and gas exploration and leasing on National Wildlife Refuges in Alaska, a supplement to the Draft CCP/EIS was prepared and made available for public review in early December, 1985. The comment period was extended for an additional sixty days at this time. During the comment period the Service received 58 written comments from local, state, and federal agencies, industry, local interests, conservation groups, and other interested parties and individuals.

Two rounds of public meetings were held in the seven local communities - Beaver, Birch Creek, Chalkyitsik, Circle City, Fort Yukon, Stevens Village, and Venetie. The first round of meetings was used to present an overview of the Draft CCP/EIS to the local residents. The second round of meetings gathered public comments on the Draft CCP/EIS. An additional meeting was held in Fort Yukon which brought together representatives from all the local communities to discuss the draft plan. In addition to these public meetings, formal public hearings were held in Fairbanks on January 7, 1986 and in Anchorage on January 9, 1986. A total of 57 people attended the second round of village meetings; 19 people (including representatives from all seven local communities) attended the Fort Yukon meeting; and 32 people attended the two public hearings with 11 people presenting oral testimony.

Public comments on the draft plan are important because they provide an indication of the public's wishes regarding overall management of the refuge and its resources. The comments provide valuable guidance to the Service as it determines how to best manage the resources which it holds in public trust. The ultimate decision on how the refuge will be managed remains with the Service, taking into account the refuge purposes, as well as existing laws, regulations, and Service policies.

After a 30-day waiting period following publication of the final CCP/EIS, the Service will issue a Record of Decision and will begin implementing the selected alternative.

Implementation and Revision of the Comprehensive Conservation Plan

Implementation of the proposed actions in this plan will depend on the availability of funds and personnel and the coordination of many governmental activities and agencies. These factors will determine the extent of development, management, and maintenance the refuge receives in any given year. Following adoption of the plan, the Service will, as necessary, undertake detailed "management planning" to guide implementation of the plan and operation of the refuge. In accordance with Service policy, detailed management plans will be prepared to address specific resource and public use management activities such as wilderness, fire, habitat, wildlife, fisheries, and recreation management.

The Yukon Flats Refuge CCP/EIS provides broad policy guidance for managing the refuge over the next 10 to 15 years. It should be viewed as a dynamic document, requiring periodic review and updating. Every three to five years the Service will review public comments, local and state government recommendations, staff recommendations, and research studies, among other sources, to determine if revisions to the plan are necessary. If major plans are proposed, public meetings may be held, or new environmental assessments/ environmental impact statements may be necessary. Full review and updating of the plan will occur every 10 to 15 years, more often if necessary.

COMMON MANAGEMENT DIRECTIONS

Management of the refuge under any alternative is governed by federal and state law, Service policy, and principles of sound resource management--all of which restrict the range of potential activities. Accordingly, certain management directions must be implemented in all the management alternatives for the Yukon Flats Refuge. These common management directions include:

- coordinating management with other resource management agencies and cooperating with owners of refuge inholdings and adjacent lands;
- studying possible land exchanges and cooperative agreements that would ensure consistent management and protect fish and wildlife habitats;
- working with the village corporations on the use and development of village lands;
- cooperating with the Alaska Department of Fish and Game (ADF&G) and other agencies in collecting data on waterfowl, fish, and big game species, public use, and other topics that are of management concern;
- cooperating with the ADF&G in ensuring that fish and wildlife populations and habitats necessary to conserve natural diversity are maintained;
- ensuring that water quality and quantity, air quality, and visual resources are protected in compliance with federal and state laws and regulations;

- ensuring that all significant historic, archeological, paleontological, and cultural resources on the refuge are protected and managed in accordance with federal and state laws;

- cooperating with ADF&G and other agencies in ensuring that subsistence opportunities are maintained by assessing potential impacts of proposed uses or activities, conducting research, enforcing regulations, and monitoring fish and wildlife populations and uses;

- ensuring, in compliance with Title XI of ANILCA, the use of snowmachines (during periods of adequate snow cover), motorboats, airplanes, and non-motorized surface transportation methods for traditional activities on refuge lands and for travel to and from homesites, subject to reasonable regulation;

- maintaining opportunities for wildlife and wildlands recreational activities on the refuge;

- providing reasonable access to the refuge so visitors can participate in wildlife and wildlands related activities; and

- allowing oil and gas exploration, including seismic surveys, throughout the refuge, subject to a determination of compatibility with refuge purposes and consistency with management objectives.

ALTERNATIVES AND ENVIRONMENTAL CONSEQUENCES

The following section briefly describes the alternatives and the potential environmental impacts that could result from their implementation. Each of the alternatives designates areas within the refuge using management categories described later in this document. All the alternatives comply with existing laws, regulations, and Service policies.

ALTERNATIVE A
The Current Situation

Alternative A, the "no action" alternative, would maintain the existing range and intensity of management actions and recreational and economic uses which now occur on the Yukon Flats Refuge. It represents what now exists, depicting the current level of refuge management being carried out by the Service on the Yukon Flats Refuge. All refuge lands are (and would continue to be) managed under the minimal management category. It is assumed that existing laws, executive orders, regulations, and policies governing Service administration and operation of the National Wildlife Refuge System would remain in effect.

Maintenance of the natural diversity of fish and wildlife populations and habitats on the refuge is a primary objective of current management. The impacts of management activities and public (subsistence and recreational) and economic uses on these populations and habitats are minimized. Ongoing studie of fish, wildlife, and their habitats would continue. Fish and wildlife populations are managed in cooperation with ADF&G. No habitat is currently

being manipulated, although the Service has prepared a prescribed burning plan for the refuge in order to improve moose habitat, to return a portion of the habitat to an earlier vegetational state, and to reduce hazardous fuel loadings. Public and economic uses of the refuge would continue to be allowed using existing access methods. Opportunities for hunting, fishing, and other recreational use, for subsistence resource harvest, and for scientific research would be maintained. No oil and gas leasing would be allowed on the refuge now, although oil and gas studies, including seismic, would be allowed where site-specific stipulations can be designed to ensure compatibility with refuge purposes and consistency with management objectives set forth in the CCP.

The pristine conditions and fish and wildlife values found on the refuge would be maintained, but no refuge lands would be protected by potential designation as wilderness.

Management Directions

The following management directions summarize Alternative A:

- maintain the refuge in a basically undeveloped state;
- emphasize the maintenance of the refuge's natural diversity and key fish and wildlife populations and habitats;
- maintain traditional access opportunities;
- provide opportunities for continued subsistence use of refuge resources;
- maintain opportunities for hunting, fishing, and other recreational activities;
- permit the continuation of current economic activities;
- maintain current management of the Beaver Creek National Wild River (as per approved management plan); and
- propose no areas of the refuge for wilderness designation.

Environmental Consequences of Alternative A

Vegetation

- Successional changes primarily from wild and prescribed fire, flooding, and oil and gas exploration.

Fish and Wildlife

- All species and habitats protected to preserve natural diversity.
- Changes in populations and habitats would result primarily from natural fluctuations and increasing human population and associated activities.
- Set back in plant succession from wildfire, flooding, and limited activities currently occurring would benefit some species.

Water Quantity and Quality

- No appreciable change from current conditions.

Social Conditions

- Negligible change in traditional lifestyles anticipated.

Economic Conditions

- No significant change from current conditions.

Recreational Use

- o Slight growth in recreational use would occur, primarily the result of regional population growth.

Subsistence Management

- o Current opportunities for participation in traditional activities by local residents would be maintained.

Environmental Consequences of the Wilderness Proposal (No areas proposed)

Wilderness Values

- o Negligible effects on wilderness values expected under this alternative.

Prescribed Burning

- o The wilderness proposal would have no effect on prescribed burning on the refuge. Although not planned under this alternative, prescribed burning would be allowed throughout the refuge, including in designated wilderness.

Commercial Timber Harvest

- o The wilderness proposal would have no effect on the level of commercial timber harvest on the refuge. Commercial timber harvest would not occur under Alternative A as all refuge lands would be managed under the minimal management category. Commercial timber harvest is not allowed under minimal management.

Mineral Development

- o The wilderness proposal would have no effect on mineral development on the refuge. Only limited mining activity with negligible impacts is currently occurring and no new mining claims can be filed on the refuge under Section 304(c) of ANILCA.

Oil and Gas Exploration, Leasing, and Development

- o The wilderness proposal would have no effect on oil and gas exploration, leasing, and development on the refuge. Oil and gas exploration can occur throughout the refuge; oil and gas leasing could occur in the future, if it is determined to be in the national interest and to be compatible with refuge purposes (plan revision required).

ALTERNATIVE B

Alternative B would permit the highest level of economic development and habitat manipulation of the five alternatives considered. Oil and gas studies would be permitted throughout the refuge and leasing and associated activities may be allowed on 68 percent of the refuge, an area which encompasses most of the refuge identified as having moderate potential for oil and gas, where site-specific stipulations can be designed to ensure compatibility with refuge purposes and consistency with management objectives set forth in the CCP. Habitat manipulation, including mechanical and water level manipulation (intensive and moderate) and timber management (intensive only), could occur. Fish and wildlife populations and habitats could be altered as a result of

increased development and habitat manipulation activities allowed under this alternative, although stipulations and mitigation measures would be employed to minimize impacts. Recreational use of the refuge would also be encouraged, with areas of the refuge open for development of public use facilities if the demand exists. Subsistence opportunities, though generally maintained throughout the refuge, could be altered by the increased economic and recreational use occurring in some areas of the refuge. No proposal for designating areas of the refuge as wilderness would be made.

In this alternative, all refuge lands would be placed in one of three management categories - intensive, moderate, or minimal management. Two areas of the refuge would be designated for intensive management - an area south of the communities of Birch Creek and Fort Yukon and an area encompassing most of the Black River country south and east of Chalkyitsik. About 22 percent of the refuge would be in intensive management.

Moderate management would be the designation for most of the remaining land included in the area identified as having a moderate geologic potential for oil and gas (Banet 1987). This area extends from the Porcupine-Kaltag fault north of the Yukon and Porcupine rivers southward into the uplands adjacent to the White-Crazy Mountains and includes the remainder of the Black River country. This category includes 46 percent of the refuge.

Approximately 32 percent of the refuge, much of it in the Hodzana Highlands, would remain under minimal management in this alternative. These areas would continue to receive a high level of protection in this alternative.

Management Directions

Alternative B shares the following management directions with Alternative A (the Current Situation). Alternative B would:

- maintain much of the refuge in a basically undeveloped state;
- emphasize the maintenance of the refuge's natural diversity and key fish and wildlife populations and habitats;
- maintain traditional access opportunities;
- provide opportunities for continued subsistence use of refuge resources;
- maintain opportunities for hunting, fishing, and other recreational activities;
- permit the continuation of current economic activities;
- maintain current management of the Beaver Creek National Wild River (as per approved management plan); and
- propose no areas of the refuge for wilderness designation.

The following management directions indicate the major differences between Alternative B and Alternative A. Alternative B would:

- provide opportunities for oil and gas leasing and development, if compatible with refuge purposes, on approximately 68 percent of refuge (approximately 1,880,000 acres in intensive management and 3,910,000 acres in moderate management);
- provide opportunities for habitat manipulation (other than prescribed burning) on approximately 68 percent of the refuge; and
- provide opportunities for commercial timber harvest on approximately 68 percent of the refuge.

Environmental Consequences of Alternative B

Vegetation

- Set back in plant succession would result from oil and gas exploration and leasing, timber harvest, mining, and prescribed burning.
- Localized long-term loss of productivity due to development.

Fish and Wildlife

- Moderate impacts to species and habitats in areas of development, impacts minimized by regulating use.
- Over 75% of refuge's wetland habitat could be adversely affected if oil and gas leasing occurs with resulting impacts on waterfowl, fisheries, and other wildlife.
- Set back in succession from prescribed fire, timber harvest, mining, oil and gas exploration, and other allowed activities would benefit some species.
- Minor localized loss of habitat from development.
- Increasing recreational use and potentially improved access could result in higher harvest of resources.
- Increase in bear/human conflicts.

Water Quantity and Quality

- Major long-term impacts to water quality and quantity would occur locally as a result of oil and gas development and other activities on the refuge; only minor long-term impacts refuge-wide.

Social Conditions

- Significant impacts to traditional lifestyles could result from increasing economic development on and public use of the refuge and potentially from improved access.

Economic Conditions

- Increased employment opportunities.
- Significant local/regional economic growth could occur.

Recreational Use

- Increase in recreational use of the refuge would occur, although this increase would not be significant.

Subsistence Management

- Opportunities for participation in traditional activities would be maintained.
- Year-round conflicts between users would increase.
- More competition for resources would occur.

Environmental Consequences of the Wilderness Proposal (no areas proposed)

Wilderness Values

- Both short and long-term impacts to wilderness values could result from oil and gas exploration, leasing, and development activities, mining, and other allowed activities, although impacts would be localized.

Prescribed Burning

- The wilderness proposal would have no effect on prescribed burning on the refuge. Prescribed burning would be allowed throughout the refuge, including in designated wilderness.

Commercial Timber Harvest

- The wilderness proposal would have no effect on the level of commercial timber harvest on the refuge. Commercial timber harvest could occur on 68% of the refuge under this alternative, although only limited harvest would be anticipated (20 acres annually).

Mineral Development

- The wilderness proposal would have no effect on mineral development on the refuge. Only a limited number of claims currently exist on the refuge and no new mining claims can be filed on the refuge under Section 304(c) of ANILCA.

Oil and Gas Exploration, Leasing, and Development

- The wilderness proposal would have no effect on oil and gas exploration, leasing, and development. Exploration activities would be allowed throughout the refuge and 68% of the refuge would be open for leasing and development under this alternative.

ALTERNATIVE C

Alternative C emphasizes the protection of fish and wildlife populations and habitats in their present state on the refuge, but would provide for a limited amount of development activity to occur on the refuge. Oil and gas studies, including seismic activities, may be allowed throughout the refuge and oil and gas leasing may be allowed on an area of the refuge encompassing the central portion of the Yukon oil and gas basin (26 percent of the refuge) where site-specific stipulations can be designed to ensure compatibility with refuge purposes and consistency with management objectives set forth in the CCP. Mechanical, chemical, and water level manipulation could occur on areas of the refuge under moderate management. A significant portion of the refuge would be managed in the minimal management category, but none of the refuge would be recommended for designation as wilderness. Subsistence harvest opportunities would be maintained throughout the refuge, as would recreational opportunities.

In Alternative C, refuge lands would be placed in either of two management categories - moderate management or minimal management. The moderate management category, which accounts for 26 percent of the refuge, encompasses the central portion of the Yukon oil and gas basin (from the south bank of the Yukon and Porcupine rivers southward into the upland area - to approximately the 1,000 foot elevation line). The remainder of the refuge (74 percent) would be managed under the minimal category. A significant area of the refuge, therefore, would continue to receive a high level of protection in this alternative.

Management Directions

Alternative C shares the following management directions with Alternative A (the Current Situation). Alternative C would:

- maintain much of the refuge in a basically undeveloped state;
- emphasize the maintenance of the refuge's natural diversity and key fish and wildlife populations and habitats;
- maintain traditional access opportunities;
- provide opportunities for continued subsistence use of refuge resources;
- maintain opportunities for hunting, fishing, and other recreational activities;
- permit the continuation of current economic activities;
- maintain current management of the Beaver Creek National Wild River (as per approved management plan); and
- propose no areas of the refuge for wilderness designation.

The following management directions indicate the major differences between Alternative C and Alternative A. Alternative C would:

- provide opportunities for oil and gas leasing and development, if compatible with refuge purposes, on approximately 26 percent of refuge (approximately 2,240,000 acres in moderate management);
- provide opportunities for habitat manipulation (other than prescribed burning) on approximately 26 percent of the refuge; and
- provide opportunities for commercial timber harvest on approximately 26 percent of the refuge.

Environmental Consequences of Alternative C

Vegetation

- Set back in plant succession would result from oil and gas exploration and leasing, timber harvest, mining, and prescribed burning.
- Localized long-term loss of productivity due to oil and gas development and timber harvest.

Fish and Wildlife

- Moderate impacts to species and habitats in areas of development, impacts minimized by regulating use.
- 30 to 40% of the wetland habitats on the refuge could be adversely affected if oil and gas leasing occurs with resulting impacts on waterfowl, fisheries, and other wildlife.
- Set back in succession from prescribed fire, timber harvest, mining, oil and gas exploration, and other allowed activities would benefit some species.
- Minor localized loss of habitat from development.
- Increasing recreational use and potentially improved access could result in higher harvest of resources.
- Increase in bear/human conflicts.

Water Quantity and Quality

- Major long-term impacts to water quantity and quality would occur locally as a result of oil and gas leasing and development and timber harvest; only minor long-term impacts refuge-wide.

Social Conditions

- Significant impacts to traditional lifestyles could result from increasing economic development on the refuge and some increases in public use.

Economic Conditions

- o Increased employment opportunities.
- o Significant local/regional economic growth could occur.

Recreational Use

- o Increase in recreational use of the refuge would occur, although this increase would not be significant.

Subsistence Management

- o Opportunities for participation in traditional activities would be maintained.
- o Year-round conflicts between users would increase.
- o More competition for resources would occur.

Environmental Consequences of the Wilderness Proposal (no areas proposed)

Wilderness Values

- o Both short and long-term impacts to wilderness values could result from oil and gas exploration, leasing, and development activities, mining, and other allowed activities, although impacts would be localized.

Prescribed Burning

- o The wilderness proposal would have no effect on prescribed burning on the refuge. Prescribed burning would be allowed throughout the refuge, including in designated wilderness.

Commercial Timber Harvest

- o The wilderness proposal would have no effect on the level of commercial timber harvest on the refuge. Commercial timber harvest could occur on 26% of the refuge under this alternative, although only limited harvest would be anticipated (20 acres annually).

Mineral Development

- o The wilderness proposal would have no effect on mineral development on the refuge. Only a limited number of claims currently exist on the refuge and no new mining claims can be filed on the refuge under Section 304(c) of ANILCA.

Oil and Gas Exploration, Leasing, and Development

- o The wilderness proposal would have no effect on oil and gas exploration, leasing, and development. Exploration activities would be allowed throughout the refuge and 26% of the refuge would be open for leasing and development under this alternative.

ALTERNATIVE D
The Preferred Alternative

Alternative D would maintain the existing range and intensity of management and recreational and economic uses on the Yukon Flats Refuge. As in Alternative A, it is assumed that existing laws, executive orders, regulations, and policies governing Service administration and operation of the National Wildlife Refuge System would remain in effect.

Under this alternative, all refuge lands would be placed in the minimal management category. This category would provide for maximum protection of the natural diversity of fish and wildlife populations and habitats that occur on the refuge. Disturbance of fish and wildlife habitats and populations would be minimized. Public and economic uses of the refuge would continue to be allowed using existing access methods. Opportunities for hunting, fishing, and other recreational use, for subsistence resource harvest, and for scientific research would be maintained. No oil and gas leasing would be allowed on the refuge now, although oil and gas studies, including seismic, would be allowed where site-specific stipulations can be designed to ensure compatibility with refuge purposes and consistency with management objectives set forth in the CCP.

The pristine conditions and fish and wildlife values found on the refuge would be maintained. The minimal management category provides the basis for the Service's recommendation for future designation as wilderness. Under Alternative D, eight percent of the refuge (in the White-Crazy mountains) would be recommended for wilderness designation and could receive the added protection of management under the Wilderness Act.

Management Directions

Alternative D shares the following management directions with Alternative A (the Current Situation). Alternative D would:

- maintain the refuge in a basically undeveloped state;
- emphasize the maintenance of the refuge's natural diversity and key fish and wildlife populations and habitats;
- maintain traditional access opportunities;
- provide opportunities for continued subsistence use of refuge resources;
- maintain opportunities for hunting, fishing, and other recreational activities;
- permit the continuation of current economic activities; and
- maintain current management of the Beaver Creek National Wild River (as per approved management plan).

The following management directions indicate the major differences between Alternative D and Alternative A. Alternative D would:

- propose the White-Crazy Mountains along the refuges southern boundary for designation as wilderness (8 percent of the refuge, some 650,000 acres).

Environmental Consequences of Alternative D

Vegetation

- Successional changes primarily from wild and prescribed fire, flooding, oil and gas exploration, and mining.

Fish and Wildlife

- All species and habitats protected to preserve natural diversity.
- Changes in populations and habitats would result primarily from natural events (wildfire and flooding), prescribed fire, oil and gas exploration, mining, and limited growth in public use.
- Set back in plant succession from natural events, prescribed fire, oil and gas exploration, and mining would benefit moose.

Water Quantity and Quality

- No appreciable change from current conditions refuge-wide or over the long term.

Social Conditions

- Negligible impacts to traditional lifestyles.

Economic Conditions

- Negligible increase in local economy if wilderness designation occurs.

Recreational Use

- Slight increase in use levels if wilderness designation occurs.

Subsistence Management

- Current opportunities for participation in traditional activities would be maintained.

Environmental Consequences of the Wilderness Proposal (8% of refuge proposed)

Wilderness Values

- Proposal would help maintain wilderness values on 600,000 acres.
- Both short and long-term impacts to wilderness values could result from oil and gas exploration and placer mining, although impacts would be localized.

Prescribed Burning

- The wilderness proposal (8% of the refuge) would have no effect on prescribed burning on the refuge. Prescribed burning would be allowed throughout the refuge, including in designated wilderness.

Commercial Timber Harvest

- The wilderness proposal would have no effect on the level of commercial timber harvest on the refuge. Commercial timber harvest could not occur under Alternative D as all refuge lands would be managed under the minimal management category (commercial timber harvest not allowed). The area proposed for wilderness designation is not an area where timber harvest would occur, so no opportunities for future harvest would be lost.

Mineral Development

- The wilderness proposal would have no effect on mineral development on the refuge. Only a limited number of claims currently exist on the refuge (none in the area proposed for designation) and no new mining claims can be filed on the refuge under Section 304(c) of ANILCA.

Oil and Gas Exploration, Leasing, and Development

- The wilderness proposal would preclude leasing on 8% of the refuge; leasing would not be allowed at this time on other areas of the refuge, but could occur in the future if in the national interest and compatible with refuge purposes.
- Exploration activities could occur throughout the refuge, but would be limited in wilderness areas.

ALTERNATIVE E

Alternative E would maintain the existing range and intensity of management and recreational and economic uses on the Yukon Flats Refuge. As in Alternative A, it is assumed that existing laws, executive orders, regulations, and policies governing Service administration and operation of the National Wildlife Refuge System would remain in effect.

Under this alternative, all refuge lands would be placed in the minimal management category. This alternative would provide for maximum protection of the natural diversity of fish and wildlife populations and habitats that occur on the refuge. Disturbance of fish and wildlife habitats and populations would be minimized. Public and economic uses of the refuge would continue to be allowed using existing access methods. Opportunities for hunting, fishing, and other recreational use, for subsistence harvest, and for scientific research would be maintained. If designated as wilderness, the refuge would be closed to oil and gas leasing. Oil and gas studies that require motorized equipment would not be allowed in designated wilderness except as provided for in Section 1010 of ANILCA.

The pristine conditions and fish and wildlife values found on the refuge would be maintained. The minimal management category provides the basis for the Service's recommendation for future designation as wilderness. Under Alternative E, all of the refuge (8.48 million acres) would be recommended for wilderness designation and could receive the added protection of management under the Wilderness Act.

Management Directions

Alternative E shares the following management directions with Alternative A (the Current Situation). Alternative E would:

- maintain the refuge in a basically undeveloped state;
- emphasize the maintenance of the refuge's natural diversity and key fish and wildlife populations and habitats;
- maintain traditional access opportunities;
- provide opportunities for continued subsistence use of refuge resources;
- maintain opportunities for hunting, fishing, and other recreational activities;
- permit the continuation of current economic activities; and
- maintain current management of the Beaver Creek National Wild River (as per approved management plan).

The following management directions indicate the major differences between Alternative E and Alternative A. Alternative D would:

- propose all refuge lands for designation as wilderness (approximately 8.48 million acres).

Environmental Consequences

Vegetation

- Successional changes primarily from wild and prescribed fire, flooding, and oil and gas exploration.

Fish and Wildlife

- o Maximum protection of all species and habitats to preserve natural diversity with wilderness designation.
- o Changes in populations and habitats would result primarily from natural events (wildfire and flooding), prescribed fire, oil and gas exploration, mining, and limited growth in public use.
- o Set back in plant succession from natural events, prescribed fire, oil and gas exploration, and mining would benefit moose.

Water Quantity and Quality

- o No appreciable change from current conditions refuge-wide and over the long term.

Social Conditions

- o Negligible impacts to traditional lifestyles.

Economic Conditions

- o Negligible increase in local economy if wilderness designations occur.

Recreational Use

- o Slight increase in use over current levels if any wilderness designation occurs.

Subsistence Management

- o Current opportunities for participation in traditional activities would be maintained.
- o Negligible increase in competition if wilderness designations occur.

<u>Environmental Consequences of the Wilderness Proposal</u> (100% of refuge proposed)

Wilderness Values

- o Proposal would help maintain wilderness values throughout refuge.
- o Both short and long-term impacts to wilderness values could result from oil and gas exploration and placer mining, although impacts would be localized.

Prescribed Burning

- o The wilderness proposal (100% of the refuge) would have no effect on prescribed burning on the refuge. Prescribed burning would be allowed throughout the refuge, including in designated wilderness.

Commercial Timber Harvest

- o Although commercial timber harvest would not be allowed under this alternative, designation of the entire refuge as wilderness would preclude all potential for future commercial timber harvest on the refuge.

Mineral Development

- o The wilderness proposal would have negligible effect on mineral development on the refuge. Only a limited number of claims currently exist on the refuge and no new mining claims can be filed on the refuge under Section 304(c) of ANILCA.

Oil and Gas Exploration, Leasing, and Development

- The wilderness proposal would preclude leasing on all of the refuge as leasing is not permitted in designated wilderness without Congressional approval.
- Exploration activities could occur throughout the refuge, but would be limited in wilderness areas.

SECTION 810 EVALUATION

Implementation of Alternative D, the Service's preferred alternative, would not result in a significant restriction of subsistence uses. Implementation of Alternative A (the current situation) and Alternative E would also not result in a significant restriction of subsistence uses. Implementation of Alternative B and Alternative C would result in significant impacts to refuge resources and increasing numbers of users, thus potentially resulting in significant restriction of subsistence activities on the refuge.

SELECTION OF THE PREFERRED ALTERNATIVE

The Service has selected Alternative D as its preferred alternative for managing the Yukon Flats Refuge, believing that it would satisfy the purposes of the refuge and that it provides a balanced approach to meeting the needs and concerns of the public. The Service would carefully monitor and regulate all uses and activities which would occur on the refuge to minimize potential adverse impacts to refuge resources in this alternative.

The selection of Alternative D as the preferred alternative is tentative. The Service will not finalize its recommendation until affected local, state, and federal government agencies, industry, local interests, conservation groups, and other interested parties and individuals have had a chance to review and comment on the proposed plan. Depending on the comments received, the Service's preferred alternative could change in varying degrees.

I. INTRODUCTION

INTRODUCTION

PURPOSE AND NEED FOR THE ACTION

The purpose of this planning action is to develop a comprehensive conservation plan (CCP) for the Yukon Flats National Wildlife Refuge, Alaska. The CCP is a congressionally mandated plan that provides broad policy guidance for managing the Yukon Flats Refuge. The CCP defines the end products or benefits toward which refuge management activities are directed, which uses may be compatible with the purposes of the refuge, and what general management strategies will be followed. It should be viewed as a dynamic document, requiring periodic review and updating. Management plans will be prepared following adoption of the final CCP, specifically addressing the management of wilderness, recreation, fish and wildlife, and other resources in meeting refuge objectives.

This document is a final environmental impact statement (EIS) describing five alternative plans (including a preferred plan) for management of the Yukon Flats Refuge. It includes a description of the existing environment on the refuge and an assessment of the long-term effects of implementing these alternatives on refuge resources. Each alternative provides differing choices for addressing internal management concerns and for resolving public issues.

Federal statute requires preparation of a plan to guide management of the Yukon Flats National Wildlife Refuge. Section 304(g) of the Alaska National Interest Lands Conservation Act of 1980 (ANILCA) directs the Secretary of the Interior to prepare, and from time to time revise, a " . . . comprehensive conservation plan . . . for each refuge (in Alaska) . . . "

This document also serves as the wilderness review for the Yukon Flats Refuge. Section 1317 of ANILCA directs the Secretary to study all lands in the refuge and make recommendations as to areas considered suitable for inclusion in the National Wilderness Preservation System. Each alternative presented in this document identifies lands suitable for wilderness designation, considering the management direction of the alternative.

HISTORICAL OVERVIEW

A long and rather complex history preceded the designation of the Yukon Flats as a National Wildlife Refuge. Prior to 1971, the Flats were part of the public domain administered by the Bureau of Land Management. With the passage of the Alaska Native Claims Settlement Act (ANCSA; 88 Stat. 688) in 1971, the Secretary of the Interior withdrew the lands now within the refuge from all forms of appropriation. Lands were identified for potential Native selection (Section 11(a)); as potential "national interest lands" (Section 17(d)(2)); and as "public interest lands" (Section 17(d)(1)).

On November 16, 1978, the Secretary of the Interior invoked his emergency withdrawal powers under Section 204(e) of the Federal Land Policy and Management Act (90 Stat. 2743), withdrawing approximately 110 million acres throughout Alaska. Including what is now the Yukon Flats Refuge, these lands were withdrawn for three years from settlement, location, entry, and selection under the public land laws, the intent being to preserve and protect the

resource values of these lands, protecting Congressional options for national interest lands legislation.

Acting under the Antiquities Act of 1906, President Carter signed an executive order on December 1, 1978 creating 17 Alaska national monuments. Included was the Yukon Flats National Wildlife Monument, consisting of some 10.6 million acres. On February 11, 1980, the Secretary of the Interior signed a series of public land orders establishing 12 new wildlife refuges in Alaska. Approximately 80,000 acres (32,000 ha) were added to the Yukon Flats National Wildlife Monument, making this monument the only wildlife monument to have a National Wildlife Refuge as an inholding.

In November 1980, d(2) legislation was finally passed. On December 2, 1980, President Carter signed the Alaska National Interest Lands Conservation Act (ANILCA; 94 Stat. 2371). With enactment of ANILCA, the Wildlife Monument designation was dropped, boundary adjustment occurred, and approximately 8.63 million acres (as of July 1986, the estimated acreage is approximately 8.48 million acres) became the Yukon Flats National Wildlife Refuge, thus becoming a part of the National Wildlife Refuge System managed by the U. S. Fish and Wildlife Service. The refuge system includes over 400 units in 49 states, including 16 refuges in Alaska (Figures 1 and 2).

PURPOSES OF THE YUKON FLATS REFUGE

Section 302(9)(B) of ANILCA sets forth the following major purposes for which the Yukon Flats Refuge was established and shall be managed:

(i) to conserve fish and wildlife populations and habitats in their natural diversity including, but not limited to, canvasbacks and other migratory birds, Dall sheep, bears, moose, wolves, wolverines and other furbearers, caribou (including participation in coordinated ecological studies and management of the Porcupine and Fortymile caribou herds) and salmon;

(ii) to fulfill the international treaty obligations of the United States with respect to fish and wildlife and their habitats;

(iii) to provide, in a manner consistent with the purposes set forth in subparagraphs (i) and (ii), the opportunity for continued subsistence uses by local residents; and

(iv) to ensure, to the maximum extent practicable and in a manner consistent with the purposes set forth in paragraph (i), water quality and necessary water quantity within the refuge.

LEGAL CONTEXT

The U.S. Fish and Wildlife Service manages national wildlife refuges pursuant to various legal and administrative requirements. The principal international treaties and federal statutes affecting planning and management of the Yukon Flats Refuge are discussed briefly below. Regulations developed to guide implementation of applicable laws are codified under Title 50 of the U.S. Code of Federal Regulations (50 CFR).

Figure 1. National wildlife refuges in Alaska.

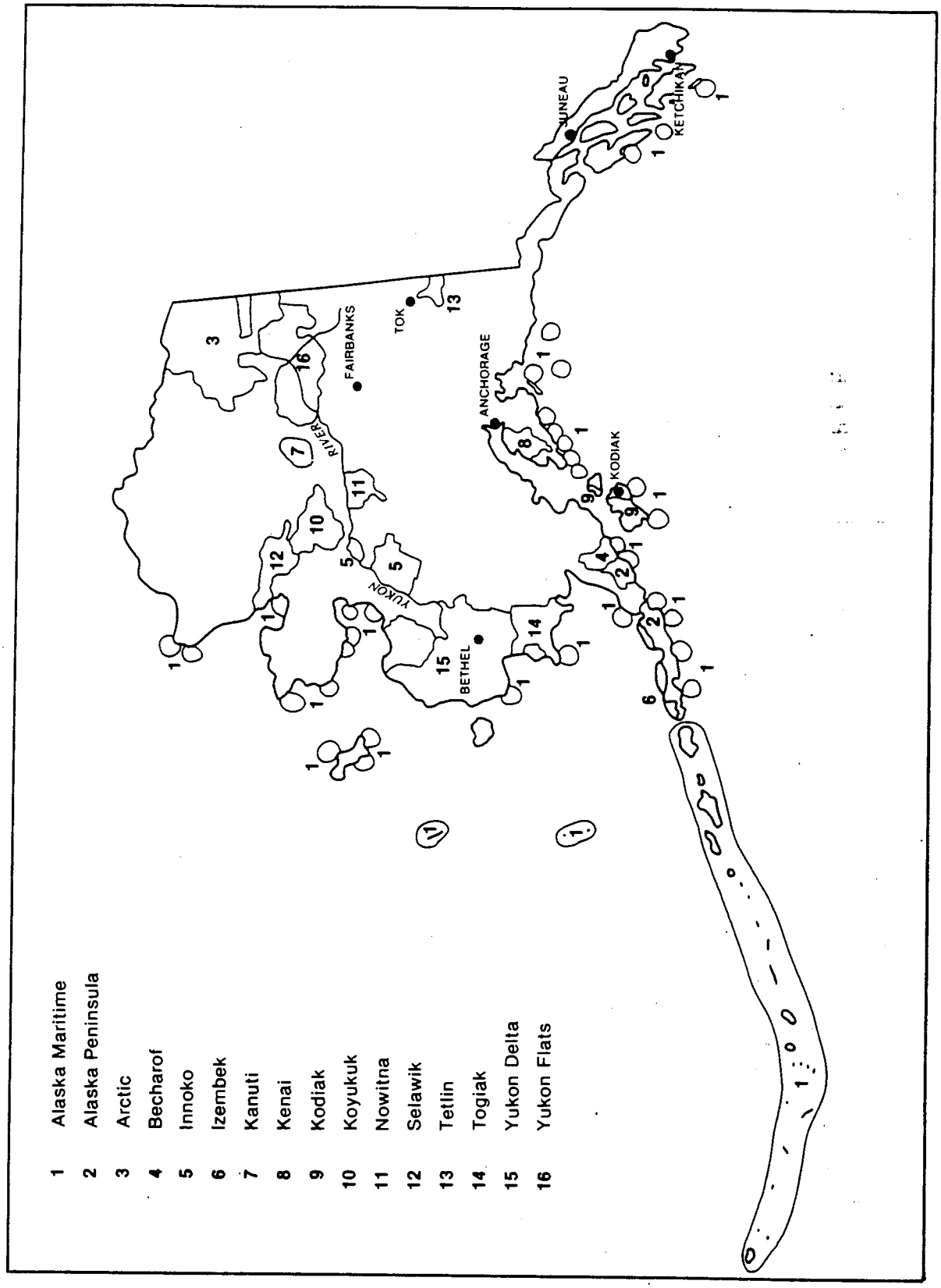
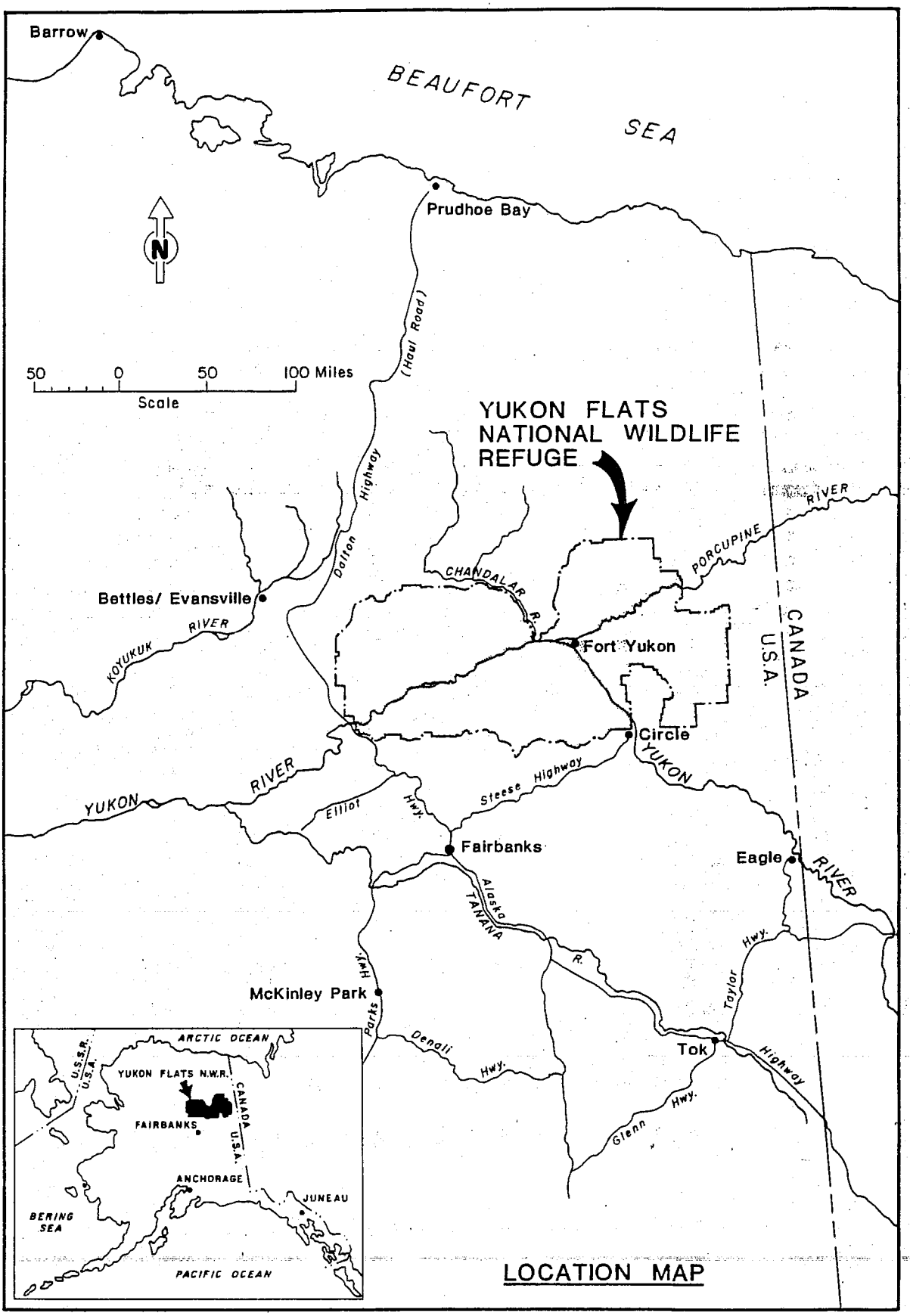


Figure 2. Location of the Yukon Flats Refuge.



International Treaties. Several treaties affect how the Service manages the Yukon Flats Refuge. Among these are migratory bird treaties with Canada, Mexico, Japan, the USSR, and the Convention on Nature Protection and Wildlife Conservation in the Western Hemisphere. These treaties differ in emphasis and species of primary concern, but collectively provide clear mandates for identifying and protecting important habitats and ecosystems and for protecting and managing individual species. These treaties are identified and their purposes summarized in Appendix G.

Treaties for migratory bird protection include management provisions such as: (1) prohibiting disturbance of nesting colonies; (2) allowing the Secretary of the Interior to establish seasons for the taking of birds and collection of their eggs by "indigenous inhabitants" of Alaska for their own nutritional and other essential needs; (3) directing each Nation to undertake, to the maximum extent possible, measures necessary to protect and enhance migratory bird environments and prevent and abate pollution or detrimental alteration of their habitats; (4) requiring each Nation to provide immediate notification to the other when pollution or destruction of habitats occurs or is expected; (5) stipulating that each Nation shall, to the extent possible, establish preserves, refuges, protected areas, and facilities for migratory birds and their habitats and manage them to preserve and restore natural ecosystems; and (6) providing that protective measures under the Treaty may be applied to species and subspecies not listed in the specific convention, but which belong to one of the families containing listed species. Of the migratory bird species of concern in the treaties, those which utilize the Yukon Flats Refuge include loons, swans, geese, ducks, hawks, eagles, harriers, ospreys, falcons, cranes, plovers, sandpipers, jaegers, gulls, terns, owls, and passerines.

The Treaty of Washington provides for the free passage of salmon and other migratory fish species in the Yukon and Porcupine rivers which spawn in Canadian waters. The U.S./Canada Salmon Interception Treaty requires negotiations between the two nations regarding Yukon River salmon. These ongoing negotiations were begun in 1985.

National Wildlife Refuge System Administration Act of 1966. This act provides guidance and direction for administration and management of all areas in the National Wildlife Refuge System, including the Yukon Flats Refuge. It provides that the system be administered by the Secretary of the Interior through the Fish and Wildlife Service. It defines key terms, established criteria for opening refuges to migratory bird hunting, and established procedures for divestiture of lands. It also established the concept of "compatibility," requiring that uses of refuge lands must first be determined to be compatible with the purposes for which individual refuges were established.

Alaska Native Claims Settlement Act of 1971 (ANCSA). This law provided for settlement of the aboriginal claims of Alaska's Eskimos, Aleuts, and Indians through grants of land and money. It provided for the establishment of Native corporations to manage the land and money that was granted by ANCSA. In exchange for this settlement, all aboriginal titles and claims, including any fishing and hunting rights, were extinguished. The corporations were the vehicle by which each Native "enrolled" and, directly or indirectly, receives benefits under ANCSA. Section 17(d)(2)(A) provided the basis for the enactment of ANILCA.

Alaska National Interest Lands Conservation Act of 1980 (ANILCA). In addition to amending ANCSA and the Alaska Statehood Act, ANILCA expands the federal conservation system throughout the state (including refuges, parks, forests, wilderness areas, and rivers and trails).

With respect to national wildlife refuges, ANILCA sets forth the purposes of each refuge, defines objectives and provisions for planning and management, and authorizes studies and programs related to wildlife and wildland resources, commodity resources, and recreational and economic uses (such as oil and gas exploration and development, subsistence opportunities, access, and transportation and utility systems).

Wilderness Act of 1964. This act established the National Wilderness Preservation System, provided the framework for designation by Congress of new units to the system, and prescribes policy for management of these areas. Section 1317 of ANILCA requires the "review, as to their suitability or nonsuitability for preservation as wilderness, all lands within . . . units of the National Wildlife Refuge System in Alaska not designated as wilderness by this Act . . . " There is no designated wilderness on the Yukon Flats Refuge.

National Environmental Policy Act of 1969 (NEPA). This act requires federal agencies to analyze impacts prior to taking major federal actions that may significantly affect the quality of the human environment. Implementation of any of the alternative plans for the Yukon Flats Refuge is considered a major action. This planning process, therefore, is subject to NEPA requirements.

Endangered Species Act of 1973, as amended. This act provides for the conservation of threatened and endangered species of fish, wildlife, and plants by federal action and by encouraging the establishment of state programs. The Act authorizes the determination and listing of endangered and threatened species and the habitat critical to those species; prohibits unauthorized taking, possession, sale, transport, etc., of endangered species; provides authority to acquire land for the conservation of listed species with land and water conservation funds; authorizes establishment of cooperative agreements and grant-in-aid to those states which establish and maintain an active and adequate program for endangered and threatened wildlife; and authorizes the assessment of civil and criminal penalties for violating the Act or implementing regulations. Section 7 of the Endangered Species Act requires federal agencies to insure that any action authorized, funded, or carried out by them is not likely to jeopardize the continued existence of listed species or modify their critical habitat.

Antiquities Act, Archeological Resources Protection Act, and National Historic Preservation Act of 1966, as amended. These laws make reference to cultural resources or govern the management of cultural resources on federal lands. The various historic preservation laws, in general, do the following.

(1) Vest ownership of historic and prehistoric properties and of materials collected from such sites with the state and federal government.

(2) Protect archeological and historic sites from unauthorized disturbance and prescribe penalties for individuals who damage (or collect from) such sites. Provide for issuing of permits to qualified individuals and institutions to conduct scientific research.

(3) Mandate the inventory and evaluation of all sites on government owned and managed lands. Inventory is the responsibility of the individual federal agency involved.

(4) Require that all projects with state or federal involvement be conducted in such a way as to protect any significant cultural resources that may be present. This includes, but is not limited to, the performance of archeological surveys, site evaluations, and, if necessary, mitigation of adverse impacts on such resources.

PLANNING PROCESS

Legal and Administrative Planning Requirements. Section 304(g) of ANILCA sets forth standards to be achieved in the development of comprehensive conservation plans for national wildlife refuges in Alaska. Specifically, prior to developing a plan for any refuge, the Secretary of the Interior is required to identify and describe:

(A) the populations and habitats of the fish and wildlife resources of the refuge;
(B) the special values of the refuge, as well as any other archeological, cultural, ecological, geological, historical, paleontological, scenic, or wilderness values of the refuge;
(C) areas within the refuge that are suitable for use as administrative sites or visitor facilities, or for visitor services, as provided for in Sections 1305 and 1306 of this Act;
(D) present and potential requirements for access with respect to the refuge, as provided for in Title XI; and
(E) significant problems which may adversely affect the populations and habitats of fish and wildlife identified and described under subparagraph (A)."

In addition, each plan shall:

"(A). . . based upon the identifications and the descriptions required . . .(as noted above) -

(i) designate areas within the refuge according to their respective resources and values;
(ii) specify the programs for conserving fish and wildlife and the programs relating to maintaining the values referred to in paragraph (B) (see above), proposed to be implemented with such areas; and
(iii) specify the uses within each such area which may be compatible with the major purposes of the refuge; and

(B) set forth those opportunities which will be provided within the refuge for fish and wildlife-oriented recreation, ecological research, environmental education and interpretation of refuge resources and values, if such recreation, research, education, and interpretation is compatible with the purposes of the refuge."

In preparing the plans, the Secretary is required to ensure adequate interagency coordination and public participation. Specifically, interested

and affected parties such as state agencies, Native corporations, and residents of local villages and political subdivisions must be provided meaningful opportunities to present their views. Further, prior to adopting a plan, the Secretary is required to issue a notice of its availability in the Federal Register, make copies available in regional offices of the Fish and Wildlife Service throughout the U.S., and provide opportunity for public review and comment.

Finally, Section 1317 of ANILCA requires the Secretary to conduct a review, consistent with provisions of the Wilderness Act, of all refuge lands in Alaska not already designated as wilderness. Based on this review and public comment, the Secretary is to forward recommendations to the President and Congress regarding any lands considered suitable for addition to the National Wilderness Preservation System.

Yukon Flats Planning Process. The planning process used to develop the comprehensive conservation plan for the Yukon Flats Refuge was designed to fulfill the legal mandates cited above as well as the administrative requirements pertaining to all units of the National Wildlife Refuge System. Each plan alternative was developed to represent a long-range strategy and a broad framework for management and use of refuge resources. The foundation upon which the alternatives were developed and evaluated was provided by the purposes of the refuge as set forth in ANILCA, by other laws and regulations governing administration and management of the refuge system, and by the missions of the Fish and Wildlife Service and the National Wildlife Refuge System. The mission of the Service is "to provide the federal leadership to conserve, protect and enhance fish and wildlife and their habitats for the continuing benefit of people." The mission of the refuge system is "to provide, preserve, restore, and manage a national network of lands and waters sufficient in size, diversity and location to meet society's needs for areas where the widest possible spectrum of benefits associated with wildlife and wildlands is enhanced and made available." Figure 3 describes the key elements and phases of the planning process.

Implementation and Revision of the Comprehensive Conservation Plan. Upon completion and adoption of the plan, the Service will, as necessary, undertake detailed "management planning" to guide implementation of the plan and operation of the refuge. In accordance with Service policy, detailed management plans will be prepared to address specific resource and public use management activities, such as wilderness management, fire management, fishery management, habitat management, and recreation management.

After implementation of the comprehensive conservation plan begins, it may be necessary to periodically review and revise portions of the plan. As knowledge of refuge resources and users improves, changes in management direction may be identified. Fish and wildlife populations, user groups, adjacent land uses, and other management considerations change with time, often in unforeseen ways. Problems may also occur in implementing the plan.

Most of the resulting changes will fine-tune the plan and will not require modification of the comprehensive conservation plan. Rather, these changes will be addressed in the more detailed refuge management plans and annual work plan advices. Only if a significant change is required in the management of the refuge would it become necessary to change the CCP. For example, a revision of the plan would be necessary if a change is required that would cause major biological or socioeconomic impacts or would be highly controversial (as evidenced by public comments).

Figure 3. The planning process.

Step 1 -- PREPLANNING
- o Identify laws, regulations, and policies affecting refuge management
- o Develop analysis methods and capabilities
- o Prepare public involvement plan
- o Hold public scoping meetings
- o Identify management issues and concerns

Step 2 -- INVENTORY AND ANALYSIS
- o Identify and compile resource information needed for planning
- o Describe the physical, biological, economic, and social environments
- o Establish data base
- o Determine capability of resources to respond to issues and concerns

Step 3 -- FORMULATE MANAGEMENT ALTERNATIVES
- o Develop management categories with specific management strategies and allowed uses
- o Apply management categories to "homogeneous" areas of the refuge
- o Develop refuge-wide management alternatives using various mixes of management categories
- o Determine management emphases of each alternative

Step 4 -- EVALUATION OF ALTERNATIVES
- o Evaluate the effects of implementing each alternative on the physical, biological, and human environments
- o Evaluate the ability of each alternative to achieve refuge purposes and resolve issues and concerns
- o Identify changes from base-line resource information

Step 5 -- PLAN SELECTION
- o Select a preferred alternative
- o Prepare and distribute a draft plan describing the alternatives and their expected effects if implemented
- o Provide opportunities for public review and comment

Step 6 -- SELECT COMPREHENSIVE CONSERVATION PLAN
- o Review and evaluate public comments received on the draft CCP/EIS
- o Prepare and distribute a final plan that responds to public comments
- o Provide opportunities for public review and comment
- o Prepare a Record of Decision

Step 7 -- PLAN IMPLEMENTATION
- o With appropriate state and public involvement, prepare a detailed management plan(s) identifying specific actions necessary to implement the CCP and achieve its goals and objectives
- o Begin implementing the plan

Step 8 -- PLAN REVISION
- o Every three years review all public comments
- o Review all local, state, and federal recommendations, scientific data, and other information to update the plan as needed
- o Publish minor changes as appendices to the plan following approval by Regional Director, notifying affected agencies and individuals
- o Make major changes by going through the CCP planning process

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To enable refuge users, local, state, and federal agencies, and other interested parties to express their views on how the refuge is being managed, the Service will periodically hold meetings or utilize other techniques to solicit comments for evaluation purposes. By encouraging continuing public input in the management of the refuge, the Service will be better able to serve the public, to determine potential problems before they occur, and to take immediate action to resolve existing problems.

Every three to five years the Service will review public comments, staff recommendations, local and state government recommendations, and research studies, among others, to determine if revisions to the plan are necessary. If major changes are proposed, public meetings may be held or new environmental assessments/impact statement may be necessary. A full review and updating of the plan, including full public involvement, will occur every 10 to 15 years, more frequently if necessary.

II. IDENTIFICATION OF ISSUES

IDENTIFICATION OF ISSUES

Section 304(g)(4) of ANILCA requires the Service to consult with appropriate state agencies and Native corporations to ensure public interests and concerns are addressed in the plans. It also requires hearings to assure that residents affected by the administration of the refuge have an opportunity to present their views. Therefore, one of the first steps in the planning process was to develop a public participation and interagency coordination program to assist in identifying the issues which need to be addressed in the plan.

PUBLIC INVOLVEMENT

During the fall of 1982 the Fish and Wildlife Service began a public involvement program for the Yukon Flats Refuge. Information regarding the comprehensive conservation planning process was distributed and public input on issues to be addressed in the plan was sought. In October and November, 1982, nine communities in interior Alaska were visited - Beaver, Birch Creek, Central, Chalkyitsik, Circle, Fairbanks, Fort Yukon, Stevens Village, and Venetie. Interested individuals were contacted and public meetings were conducted to identify local issues. Meetings were held with state and local government leaders, Native organizations, and conservation groups to get their input. A notice in the Federal Register, advertisements in newspapers, and mailed notices were used to request written comments from interested citizens.

PUBLIC CONCERNS

A summary of the information provided by those who participated in this public involvement process follows. In evaluating the input received, an attempt was made to summarize the concerns expressed by the public relative to management of the refuge and to identify the important issues for the Yukon Flats Refuge which can be addressed in the Comprehensive Conservation Plan.

Access and Transportation. People commented more about access and transportation than about any other issue. There was considerable opposition to construction of roads, particularly any roads near the villages. Many people stated that roads would bring too many people into the area. Though some expressed concern about the impacts that an influx of people would have on wildlife, more spoke of concern about the effect that roads would have on village life. A few comments favored building roads if there is a proven need for them. Some stated that roads would enable more people to enjoy the refuge.

Attitudes toward other forms of transportation (i.e., snowmobiles, boats, airplanes, all-terrain vehicles) were more mixed. While there was recognition that local villagers depended on all these craft to some extent, there was considerable concern about their use by people from outside the area. People also spoke of concern about vehicles that would damage the environment.

People were also concerned about the use of traditional access trails between villages. Concern was expressed that individual trappers might try to claim trails as their private traplines and prevent others from traveling them.

Fish and Wildlife Populations and Habitats. Habitat. Several individuals stated the Service should not build any structures such as dams and dikes to manipulate habitat. A few people said that lakes in the Yukon Flats seemed to be drying up and becoming choked with brush, making the habitat poorer for muskrat, birds, and moose. It was suggested that wheeled vehicle be prohibited or used only on established trails because of potential damage to the habitat.

A number of people voiced concern about the possible destruction of wildlife habitat that might come with the building of roads or other construction related to development. There was concern about pollution of streams caused by mining operations. (Comments about fire and habitat are discussed in the section about fire.)

Hunting, Fishing, and Trapping. Trapping. Views were expressed that trapping should be a primary management objective for the refuge and should continue to be an acceptable use on the refuge. Some stated that no fee should be assessed for trapping on federal lands, that trapping should not be considered a commercial enterprise because the success rate is extremely uncertain, and that if a trapline is not being used it should be forfeited. Many people expressed opposition to the use of planes to tend traps. Concern was expressed about people claiming traditional access trails as private traplines.

Hunting and Fishing. Many people stated opposition to the use of airplanes for hunting. They said that airplanes gave some an unfair advantage in locating game, that people were hunting illegally from planes, and that the noise frightened the animals. Certain individuals expressed a need for better enforcement of hunting regulations. Some people said that hunting and fishing are their only way of making a living and providing food for their families. They expressed a desire to continue past subsistence hunting practices.

Several people indicated that some hunters were taking antlers and wasting the remainder of the animal. A suggestion was made that if animal populations show a significant decline, hunting privileges should be withdrawn.

Fire. There were a number of differing views concerning fires. Some people stated that burns would bring back the moose population, but more said that fire was damaging to wildlife. Others were concerned about the personal property destroyed by fire. The point was made that fire fighting is an important source of income for village people.

Cabins. Several people stressed the importance of cabins for shelter while hunting and trapping, but there was some opposition to cabins strictly for recreational purposes. Some comments emphasized that cabins should be constructed of logs, set back from the river's edge, and situated in a way to blend into the natural setting. Cabins built as refuge office facilities were considered acceptable in the villages but not in wild areas. One Fairbanks resident was particularly concerned that semi-permanent tent frame camps might not be allowed to remain in place.

Tree Cutting. Permits for tree cutting were considered to be a problem, mainly due to the present procedure involved. Cutting trees for building homes and for firewood was supported; commercial use of trees was not. One person commented that a provision for subsistence users to cut live timber should be allowed if dead timber was not available.

Recreation. There were many complaints about "floaters" or river runners. It was said that they litter, steal, start forest fires, take game illegally, and travel without adequate equipment for their own safety. A few people, however, were less critical.

Many people expressed opposition to development of campgrounds. There was concern that campgrounds would draw too many people, that these people would interfere with hunting and other traditional uses, and that the natural beauty of the area would be diminished and the concept of the refuge destroyed.

Those not opposed to campgrounds suggested that a limited number be developed and that they should retain the natural environment as much as possible, should be open only at certain times of the year, and that there should be a limit to the number of people allowed entrance.

Some young people stated that a visitors' center would be a good idea as a point of information for the area, but one person indicated it would be a waste of taxpayers' money. Fort Yukon and Circle were suggested as possible sites for a visitor center.

Private Lands. Some people suggested the government purchase all inholdings from willing sellers or give inholders lands outside the refuge in exchange for their inholdings. Others objected to any government purchase of private lands, fearing they might lose access to lands that local people have used for generations. The need for sufficient access across refuge lands to private inholdings was also identified as an issue.

Mineral Exploration and Development. There were numerous concerns about the water pollution that has resulted from the present mining operations outside the refuge. For this reason, many people were opposed to mining on the refuge. Others supported mining as an activity on the refuge.

Oil and Gas Exploration and Development. People spoke both for and against oil and gas development. Those opposed to it stated that it would harm wildlife and habitat and that traditional uses should have priority over oil and gas development. Those who favored oil and gas development saw an opportunity for employment for local people and a possibility that fuel costs might go down.

Wilderness. Wilderness designation was seen as imposing more restrictions on local people and bringing more outsiders to the area. A suggestion was made to consider the lower Brooks Range and the north side of the White Mountains for wilderness designation.

Managing the Refuge. It was suggested that someone from the Fish and Wildlife Service spend more time living and working in each village to develop a better understanding of the communities. There were many comments that local people should share in the final decisions in the planning process. Several people said that the land should be left as it is. Others talked of the difficulty in getting permits from the refuge office in Fairbanks. It was suggested that people in the villages should be hired to issue permits locally.

Miscellaneous. People were worried that local concerns would not be met and that their comments would be ignored. They requested that they be kept informed at all stages of the planning process and that all comments be made available to the public.

ADDITIONAL ISSUES IDENTIFIED DURING THE PLANNING PROCESS

Since the initial round of public involvement in the fall of 1982, the Service has continued to meet and work with other federal agencies, state and local government, Native organizations, conservation and other organizations, and interested members of the public as the plan was developed. During these meetings many of the issues and concerns expressed during the initial round of scoping meetings were reiterated and new concerns were voiced. Several issues of particular concern to the planning effort were identified.

A number of people reiterated their concern that designating areas of the refuge as wilderness would restrict their use of these areas. Concern was focused on the possibility that wilderness designation would result in future restrictions of traditional access methods and limitations on subsistence activities. This issue was discussed previously under Public Concerns.

Predator control was raised as an issue of concern subsequent to the initial round of public involvement meetings. Since those meetings, predator control has become a major issue in the State of Alaska and is of particular concern on the Yukon Flats Refuge because of the low moose population in parts of the refuge. A joint Alaska Department of Fish and Game (ADF&G)/FWS study is currently underway on the refuge examining the possible role of wolf predation on the refuge moose population. Predator control may be allowed on refuge lands, provided the need for such control can be justified biologically. Predator control would be permitted under all management categories (including designated wilderness) in all management alternatives.

Residents of several local communities identified commercial timber harvest on the refuge as an issue of concern to them. Most of those commenting supported timber harvest on the refuge as a method of economic development which would be beneficial to the local village corporations and residents. It was suggested that timber development be allowed along the river corridors. Harvest of timber for commercial purposes, including harvest of houselogs and firewood, would be permitted in areas of the refuge under intensive and moderate management.

STATE OF ALASKA POSITION PAPER

Early in 1984, the State of Alaska provided the Service with resource management recommendations for the Yukon Flats Refuge and surrounding area. While this paper covers a broad spectrum of issues of concern to all state agencies, most recommendations are related to management of fish and wildlife resources. The paper identifies the State's current management policies and objectives, identifies management issues, and recommends solutions to these issues. The issues addressed range from public access to refuge resources and the need for more research on fish, wildlife, and habitat management.

The State has requested that the Service cooperate with the State in the collection, interpretation, and dissemination of research data, statistical data, banding and tagging records, population data, census information, harvest tabulations, and other use information for fish and wildlife in the Yukon Flats Refuge. The State identified the need to consolidate existing information about various land uses (such as hunting and fishing patterns, subsistence activities, and recreation) and to collect additional information. The State requests Service cooperation in designing and implementing (with cooperation from local governments and regional organizations) a harvest monitoring system capable of providing accurate subsistence data.

The State advocated adoption of a liberal approach to public access. All refuge trails, waterways, and aircraft landing areas that are now open should remain so. Off-road vehicles are a traditional means of access for hunters, anglers, trappers, and other recreationists and their continued use should be allowed. Public use of cabins on the refuge should continue, facilitating recreational and subsistence uses and providing for public safety. Cabins should be maintained and replaced with new cabins, if necessary.

The importance of protecting key wildlife areas, such as stream confluences, spawning areas and fishery migration routes, mineral licks, nesting and calving areas, and winter ranges, is stressed in the state's recommendations. Any resource exploration or development activities, or the development of refuge facilities (such as support facilities, trails, or campgrounds) should avoid these areas.

The Service should maintain the State's opportunity to implement established fisheries enhancement techniques and to conduct future research on the refuge. Opportunities for ADF&G to conduct aerial, ground, and boat surveys of fish and wildlife should not be unduly restricted by cumbersome permit requirements. The erection and maintenance of any facilities or structures necessary for fish and wildlife management should be allowed.

The State requests that the Service adopt management plans that are in substantial agreement with state wildlife management plans. Development and implementation of habitat management plans on the refuge should be done in cooperation with the state. Such plans should consider various means of habitat management, developing plans consistent with the needs of fish and wildlife populations. Continued cooperation in developing fire management plans was stressed.

MANAGEMENT CONCERNS

In addition to public involvement in identifying issues, Section 304(g) of ANILCA requires the Service to identify and describe "significant problems which may adversely affect the populations and habitats of fish and wildlife" found on the refuge. Significant problems affecting the Yukon Flats Refuge were identified by the planning team, including the refuge staff, and are discussed in detail below.

Refuge Inholdings. The Yukon Flats Refuge boundary encloses over 11 million acres. Of this land, 8.63 million acres were designated by ANILCA for inclusion in the National Wildlife Refuge System (8.48 million acres according to Bureau of Land Management (BLM) land status records as of July 1986). Almost completely enveloped within this acreage is about 2.7 million acres of private inholdings represented by six Native village corporations and Doyon, Ltd. (the regional Native corporation). The amount and location of these large blocks of private inholdings create a significant long-term management concern for the Yukon Flats Refuge.

At present, the private inholdings remain relatively intact and highly productive from a fish and wildlife standpoint. These lands, though, could be developed in the future for a variety of uses including oil and gas development, agriculture, and commercial timber harvesting. Although such development is more likely to occur on private inholdings than on the refuge proper, a number of effects on surrounding refuge lands could result from development (i.e., loss and/or alteration of habitat, water pollution, increased exploitation of resources).

In addition to the Native corporation holdings, a small amount of land is held in trust by the United States for individual Natives (as allotments). The rights to hold these allotments were granted by the Native Allotment Act of 1906 (rights to apply for allotments were repealed by the Alaska Native Claims Settlement Act). Trust title to these lands are granted to the individual. Under trust title, approval of the Bureau of Indian Affairs is required prior to alienation. Requests for rights-of-way or other legal access to or through these allotments must also be approved by the Bureau of Indian Affairs. Some 495 Native allotment applications have been filed on the refuge. These applications were filed under the Native Allotment Act of 1906 and were approved under Section 905 of ANILCA, although the BLM has not completed pro forma notices of legislative approval on many of the applications. These allotments, ranging up to 160 acres in size (45,900 acres total under application or already conveyed), are scattered throughout much of the refuge and pose less management concern than do the Native corporation inholdings.

Private inholdings within a variety of land management units (National Parks, National Forests, National Wildlife Refuges) often create problems and inefficiencies in land and resource management for both the public land manager and the private land owner. These problems are the result of differing goals for land use between public and private land owners. When all parties are agreeable, the Service would be willing to enter into cooperative management agreements with private inholders. Such agreements would result in more uniformity in land management and would reduce potential conflicts with and impacts on wildlife habitat which can result from differing land use goals.

An example of the problems that refuge inholdings have on the Yukon Flats Refuge relates to waterfowl habitat. During the early 1960's, studies related to the Rampart Canyon Dam Project identified the Yukon Flats as a significant waterfowl production area. Within an estimated 6.8 million acres described as waterfowl habitat (below the high water line - 640 foot elevation - of the Rampart Dam pool), 3.6 million acres (53 percent) were determined to be high production waterfowl areas (Lensink 1965 unpubl., USDI 1965.)

Presently, of the 6.8 million acres initially defined as waterfowl habitat, 60 percent is within the refuge proper, 40 percent is in private inholdings. Of the 3.6 million acres of high waterfowl production areas, 75 percent is in private ownership and 25 percent is on the refuge proper. Thus, waterfowl management opportunities on the unencumbered refuge lands are associated with a significantly smaller portion of the high production waterfowl habitat than envisioned in earlier refuge proposals and conceptual plans.

Development and Use of Adjacent Lands. Lands adjacent to the Yukon Flats Refuge are controlled by a number of entities: BLM, U.S. Fish and Wildlife Service (Arctic Refuge), the State of Alaska, and Native regional and village corporations. Many fish and wildlife species range between refuge lands and these adjacent lands. Use and development of adjacent lands, therefore, may adversely affect fish and wildlife populations and habitats on the refuge.

Potential activities on adjacent lands include exploration for and development of oil and gas, agricultural development, timber harvesting, and development of transportation corridors. These activities may contribute to numerous adverse effects on fish and wildlife populations and habitats, both on and off the refuge. Impacts may include loss or alteration of habitats, increased pollution, increased exploitation of available resources, increased human use, and introduction of non-native fish, wildlife, and plant species. For example, off-refuge placer mining is adversely affecting water quality and aquatic habitat on Birch Creek within the refuge. (The Service will work with

the Environmental Protection Agency, the BLM, and the Alaska Department of Environmental Conservation to develop a plan to rectify this problem).

Coordination between federal and state agencies during all land-use planning activities is necessary to assure management integrity between adjacent lands. Even with coordination, the goals, objectives, and regulations under which various federal and state agencies operate may result in significant management variation along contiguous boundaries or on the same river. In addition to land-use planning, specific programs and activities such as the BLM and state land disposal programs and fire suppression activities can result in inconsistencies with refuge plans and programs and can adversely affect refuge resources without a coordinated planning effort.

Lack of Data on Wildlife Populations, Habitats, and Their Uses. There are large gaps in our understanding of wildlife and fish populations, habitats, and their uses on the Yukon Flats Refuge. The Yukon Flats is a new refuge in an isolated area where little research has been undertaken to date.

The continued presence of wildlife and fish species on the refuge depends on management. The key to good management is adequate data. Information on wildlife and fish resources on the Yukon Flats is needed for four main reasons. 1) As a basis for developing harvest recommendations for resident fish and wildlife species on the refuge and for migratory bird and fish species on and off the refuge. 2) To make knowledgeable habitat management decisions, such as where to prescribe burn or regulate human access. 3) To assess the effect of development and plan for development in areas where impacts would be minimal. Oil and gas exploration and development, transportation corridors, and agricultural development are potential activities on the refuge that can affect wildlife and fish resources. 4) To expand scientific knowledge about wildlife and fish species both for the sake of science and for the general benefit of people using fish and wildlife resources.

Waterfowl populations are the best studied wildlife resource on the refuge, although research has been limited to population trend surveys. Important data gaps exist concerning waterfowl/habitat relationships, particularly for those national resource species found in significant numbers on the refuge such as canvasbacks, pintails, sandhill cranes, and white-fronted and Canada geese. The effect of subsistence use on waterfowl populations is unknown.

Less is known about other species. Very low moose populations/densities (as low as one moose per ten square miles) are common on the refuge. Why such low populations occur is not fully understood. This lack of understanding indicates a need for more information on the relationships between moose/predators/humans/habitat. Similarly, despite the importance of furbearers to residents of the upper Yukon, little is known about furbearer ecology in the area. The Yukon and its tributaries constitute major fishery habitat. Continued protection of critical coho, chinook, and chum spawning grounds and migratory streams is dependent on knowing where these areas are. Overwintering areas for resident fish species also require protection. Although some areas have been located, many overwintering areas remain to be identified. In addition, serious gaps in fish species life histories and fish/habitat relationships still exist. Fisheries management is difficult without this supporting scientific data.

Without adequate data the Service is unable to optimally meet the combined goals of wildlife, fish, and water conservation as well as continued local subsistence use of these resources. With little data the Service will tend to adopt conservative management policies which may preclude maximizing public benefits.

Fire Suppression. Wildfire is a natural and important phenomenon in the ecology of the Yukon Flats, having a significant effect on the quality and character of fish and wildlife habitat. As a result of naturally occurring fires, vegetation patterns on the Yukon Flats would normally present a complex mosaic of forest stands differing in age, composition, and character, providing habitats for a variety of wildlife species. Since the 1950's it has been the policy to suppress all fires. This practice has altered the natural pattern of fire occurrence and has allowed for natural fuels to accumulate.

Since 1984 the refuge has been conducting its wildfire management program under the guidance of the Upper Yukon-Tanana Fire Management Plan. In essence, the old policy of total suppression has been replaced with a fire management program. Under the new policy fire suppression activities occur at four levels. (Refer to AIFMC Upper Yukon-Tanana Fire Management Plan for a detailed description of these options.)

The four suppression levels can generally be applied as follows. Around native villages, suppression is classified as critical because of the potential for loss of human life. Other native lands extending outward from the villages will, in most cases, receive full suppression. Refuge lands surrounding inholdings will usually be classified as modified suppression areas. Limited suppression will occur in other more remote areas of the refuge.

Continued utilization of modified or full suppression on much of the land within the refuge will result in the build-up of natural fuels which could eventually result in "disasterous" fires and which cause decreased vigor and diversity in plant communities of these areas. The refuge will be unable to manage these areas in the most sound ecological manner. In addition, costs associated with modified or full suppression are greater than if utilizing limited suppression. Though full suppression may not be the most ecologically sound method of fire control, native villagers view fire fighting activities as a ready source of seasonal employment and income for their citizens. Educational programs should be initiated which will lead to a better understanding of the beneficial effects of fire on the environment and to explain the uses of fire as a management tool for enhancing habitat conditions.

Fire suppression activities may create numerous adverse impacts to fish, wildlife, and other resources found on the refuge. These impacts range from preventing a mosaic of habitats from developing and decreasing vigor of habitats to sedimentation of streams and lakes caused by increased runoff from fire lines and other suppression activities to possible destruction of cultural resource sites. Fewer impacts are probable with limited suppression action than with full or modified suppression, though the natural impacts resulting from the fire itself could be greater.

Water Pollution Problems on Birch Creek. Placer mining in the headwaters of Birch Creek, a upper segment being a National Wild River, has resulted in significant deterioration of water quality. Although mining activities occur outside the refuge on lands administered by the Bureau of Land Management (BLM), water quality problems are still evident in the on-refuge portion of Birch Creek. Accessibility to the upper reaches, combined with the high price of gold, has and will continue to keep development in the area active. A cooperative effort involving the Service, the Environmental Protection Agency, the BLM, and the Alaska Department of Environmental Conservation needs to be undertaken to develop a plan to rectify the current water quality impacts on Birch Creek.

Water quality standards are well defined, however, without enforcement effort or an economical method of water treatment, the problems of Birch Creek will continue. Impacts are associated with two primary factors: excessive sediment load in the stream system and toxic heavy metal precipitation on bedload sediment particles.

A loss of aquatic habitat has occurred in the upper reaches of Birch Creek as the result of placer mining activities in the area. Studies underway by the Alaska Cooperative Fishery Research Unit have found that streams where miners discharged their wastes into the water had far less aquatic life. Levels of sediments were found to be 5 to 95 times the legal effluent discharge limits. Few invertebrates were found within Birch Creek and no algae growth was found.

Both settleable and non-settleable solids are plentiful. Settleable solids will drop out when water slows down. The non-settleable solids are very fine and give the water a cloudy appearance called turbidity. Fish avoid the highly turbid waters of this portion of Birch Creek. Sight feeding fish are unable to feed as well as in clear water, thus limiting their growth. Some gill abrasion has been noted. Excessive sediment loads have also caused loss of spawning habitat due to clogging of spawning gravels. Deposition of sediments has also reduced or blocked the interchange of surface and subsurface water. Within the Yukon Flats Refuge, turbidity is the primary factor affecting aquatic habitats and fisheries. Turbidity standards can be met through the use of a closed system with complete recycle capabilities, though such systems involve considerable expense.

An ADF&G study supports these findings, concluding that "Placer mining in the Birch Creek watershed resulted in (1) elimination of the riparian vegetation; (2) increased particle embeddedness and a higher proportion of silt and sand deposited on the stream bottom below mining; (3) elimination of fish habitat; (4) depressed aquatic invertebrate populations; and (5) elimination of all fish from mined streams and from streams above active mining" (Weber and Post 1985).

Heavy metal studies have been undertaken on the upper reaches of Birch Creek. Recent studies by the Cooperative Unit indicate that sediments contain considerable amounts of heavy metals - elevated amounts of copper, zinc, lead, and arsenic. The effects of high concentrations of heavy metals are not fully understood or documented on Birch Creek.

Although most studies of Birch Creek have occurred in the vicinity of placer mining activities upstream of the refuge, impacts to the water quality of Birch Creek have been noted by the residents of the community of Birch Creek. " . . . data from the Alaska Department of Natural Resources shows that in certain instances in 1985, turbidity levels at the village exceeded the drinking water standard by 1,400 percent" (letter from Mack, hydrologist for the Alaska Department of Natural Resources, to Barnett, attorney for plaintiffs, in Sierra Club et al. 1986). Birch Creek residents have not caught grayling in the river for years and trapping harvests along the river are down by fifty percent (declaration of Susan James, vice president of the Birch Creek Village Council, in Sierra Club et al. 1986).

How the impacts of mining on Birch Creek are affecting other wildlife species, such as waterfowl, are not understood. Little knowledge of the health and safety problems which may be associated with downstream use of Birch Creek. "The water, which was formerly crystal clear, must be sanitized with clorox or boiling before drinking. Even so, there have been unexplained cases of sickness that the people attribute to drinking the river water." (declaration of Susan James in Sierra Club et al. 1986).

Management of Migratory Fish. Fishery management is complicated by the migratory behavior of most fish species indigenous to the refuge. Refuge fish exhibit lengthy migrations of 50 to over 3000 miles associated with their yearly spawning or life cycles. The total ecosystem for three of the five Pacific salmon species (chinook, chum, and coho) includes refuge streams, the Yukon River, parts of the north Pacific Ocean, and the Bering Sea. Although several river systems are entirely within refuge boundaries, others pass through the refuge. Diverse land ownership complicates management.

In the ocean salmon are protected by harvest regulations set by the North Pacific Fisheries Council (United States, Japan, and Canada), by bilateral agreements with the Soviet Union, and by state regulation. On spawning runs, they are protected by state harvest regulations based on observation of spawning run strength, by instream harvest surveys, and by aerial surveys.

Further complications arise in the multiple use of the salmon species. The overall management objective of the fishery resources of the Yukon River is for maximum sustained yield. Escapement needs must be met. Subsistence needs are the next priority, followed by commercial harvest which removes the harvestable surplus (see Tables 9 and 10 and Appendix F).

During the past few years, escapement to spawning areas has been declining. Incidental Yukon River chum salmon harvest in the sockeye fishery in the Unimak Island area is one of the reasons for the declining escapement of fall chum salmon. The decreasing escapement of chum and other salmon species reduces the availability of salmon for mammals, birds, and predatory fish on the refuge. Service assistance in monitoring escapement will aid ADF&G in assuring that escapement needs are met.

Difficulties in Managing the Refuge. The Yukon Flats Refuge, consisting of 8.48 million acres (according to BLM land status records in July 1986), lies some 75 air miles north of Fairbanks. Refuge headquarters are located in Fairbanks where a small staff is stationed. No employees are currently stationed on the refuge. This makes it very difficult to adequately monitor and control uses occurring on the refuge. Use of local hires, or stationing personnel on the refuge, would reduce the time and expense involved in issuing use authorizations as well as improve the level of enforcement, surveillance, and monitoring of uses on the refuge.

The refuge office issues Special Use Permits (SUP's) which authorize various activities to occur on the refuge. These activities include cabin construction and occupancy, helicopter use, geological studies, cutting of house logs, commercial guide operations, off-road vehicle use, gravel removal, communication sites, and other commercial activities. Hunting and fishing activities, public use activities such as river floating and camping, and subsistence uses also occur on the refuge. Only a limited amount of enforcement, surveillance, and monitoring of these activities is currently being undertaken. Thus unauthorized activities may be occurring, resource harvest regulations may not be adhered to, stipulations and conditions attached to SUP's authorizing use may not be followed, and little information is being collected on uses which do not require authorization.

The absence of an adequate level of enforcement, surveillance, and monitoring may result in significant damage to and illegal harvest of fish and wildlife populations and other resources found on the refuge. Increased "visibility" of refuge personnel would not only allow for more enforcement and monitoring of activities, but it would provide "preventive enforcement" and increased visitor contact.

The lack of staff and limited amount of field time are also major factors contributing to the lack of biological data on the refuge. This concern was discussed previously.

IDENTIFICATION OF SIGNIFICANT PLANNING AND WILDERNESS ISSUES

In identifying significant planning and wilderness issues for the Yukon Flats CCP/EIS, the planning team reviewed the public concerns identified during the scoping process and the management concerns identified by the refuge staff and other Service personnel. Table 1 summarizes the issues and areas of concern which have been identified through the scoping process for the Yukon Flats Refuge. While this table does not identify all the issues and concerns identified, it does attempt to focus attention on those the Service considers to be the most important. These issues and concerns were then analyzed in more detail in order to determine which issues are significant planning and wilderness issues for the Yukon Flats CCP/EIS.

Access and Transportation

Comprehensive Conservation Plan

- What impact will the comprehensive conservation plan have on the continued use of traditional methods of access?

Continued use of traditional methods of access is not a significant issue in terms of the CCP. Under Section 1109 of ANILCA, valid existing rights of access are guaranteed. Section 1110(a) allows the use of snowmachines, motorboats, airplanes, and nonmotorized surface transportation methods for traditional activities and for travel to and from villages and homesites, subject to reasonable regulation. Section 811 permits, for subsistence purposes, appropriate use of snowmobiles, motorboats, and other means of surface transportation traditionally employed for such purposes by local residents, subject to reasonable regulation.

- What impact will the comprehensive conservation plan have on the continued use of traditional access routes?

The continued use of traditional access routes on the refuge is not a significant issue in terms of the CCP. See the above discussion on use of traditional access methods.

- What impact will the comprehensive conservation plan have on the construction of roads for public use on the refuge?

Construction of roads for public use on the refuge is not a significant issue in terms of the CCP. Under Section 1109 of ANILCA, valid existing rights of access are guaranteed. Section 1110(a) allows the use of snowmachines, motorboats, airplanes, and nonmotorized surface transportation methods for traditional activities and for travel to and from villages and homesites, subject to reasonable regulation. Section 1110(b) assures that the state or private owner or occupier of state owned or privately owned land, including subsurface rights, or a valid mining claim or other valid occupancy

Table 1. Major issues and concerns identified for the Yukon Flats Refuge.

Access and Transportation
- o continued use of traditional methods of access
- o continued use of traditional access trails
- o construction of roads for public use

Fish and Wildlife Populations and Habitats
- o maintenance of populations and habitats
- o predator control
- o prescribed fire
- o mechanical manipulation and other habitat improvement techniques

Subsistence
- o continued use of refuge for hunting, fishing, and trapping
- o continued use of refuge for harvesting of firewood and house logs

Fire Protection
- o protection of private property

Cabins
- o opportunities for cabin construction

Commercial Timber Harvest
- o harvest of refuge timber for commercial purposes

Wilderness
- o need to protect refuge resources
- o restrictions on traditional activities and access

Recreation
- o development of campgrounds and other facilities

Private Lands
- o access to inholdings/traditional use areas
- o development and use of refuge inholdings
- o impacts from off-refuge development

Mineral Development
- o provision for mining activities

Oil and Gas
- o provision for oil and gas exploration, leasing, and development

Management of Refuge
- o local participation in planning and management of the refuge

shall be given such rights as may be necessary to assure adequate and feasible access for economic and other purposes to these lands, subject to reasonable regulations. Construction of roads, pipelines, and transmission lines not subject to the above provisions could occur depending on the management category proposed in the CCP. However, the probability of roads or other utility corridors not covered by Section 1110(b) being requested during the life of the plan are low. Service roads and other utility corridors required for possible oil and gas development are discussed under oil and gas later in this chapter.

Wilderness Designation

o What will be the impact of wilderness designation on the continued use of traditional methods of access on the refuge?

The continued use of traditional methods of access is not a significant wilderness issue. See the discussion above. Whether an area is or is not wilderness will not affect the use of traditional methods of access.

o What will be the impact of wilderness designation on the continued use of traditional access routes on the refuge?

The continued use of traditional access routes is not a significant wilderness issue. See the discussion under CCP above. Whether an area of the refuge is or is not designated wilderness will not affect the use of traditional access routes.

o What will be the impact of wilderness designation on road construction on the refuge?

Wilderness designation would not have a substantial impact on the construction of roads or other utility corridors on the refuge, therefore this is not a significant wilderness issue. No proposals to build transportation corridors through the refuge have been made, and the probability of such proposals during the next 50 years is low. Any transportation corridors which may be proposed would probably be to provide access to private inholdings for economic or other purposes or for travel to and from villages and homesites, activities which are guaranteed under provisions of Title XI of ANILCA. Service roads and utility corridors related to oil and gas development are discussed under oil and gas later in this chapter. Transportation corridors can be built through designated wilderness, subject to the provisions of Title XI. These provisions include Congressional concurrence.

Fish and Wildlife Populations and Habitats

Comprehensive Conservation Plan

o What impact will the comprehensive conservation plan have on the amount of habitat and the population level of fish and wildlife on the refuge?

This is not a significant issue. The purposes for establishing the Yukon Flats Refuge are set forth in Section 302(9)(B) of ANILCA and include:

"(i) to conserve fish and wildlife populations and habitats in their natural diversity including, but not limited to, canvasbacks and other migratory birds, Dall sheep, bears, moose, wolves, wolverines and other furbearers, caribou (including participation in coordinated ecological studies and management of the Porcupine and Fortymile caribou herds) and salmon . . . "

Alternatives addressed in the CCP are different ways of carrying out this purpose. The effects of the alternatives on fish and wildlife populations and habitats are analyzed in the environmental consequences chapter.

o What impact will the comprehensive conservation plan have on the level of predator control on the refuge?

Predator control is not a significant issue in the CCP. Where biologically justified and implemented in accordance with provisions of NEPA, predator control will be permitted on all areas of the refuge regardless of the management category or the alternative being implemented.

o What impact will the comprehensive conservation plan have on the amount of prescribed burning on the refuge?

Prescribed burning on the refuge is a significant issue in terms of the CCP. The Service has developed a prescribed burning plan for the Yukon Flats Refuge which is designed to improve moose habitat. This plan has been approved (in 1986) and the program of prescribed burning outlined in the plan will be undertaken. Depending on the success of the burning in meeting its objectives, the program could be expanded in the future.

o What impact will the comprehensive conservation plan have on the amount of other methods of habitat improvement on the refuge?

Use of other methods of habitat improvement on the refuge is not a significant issue in the CCP. The Service is not planning to undertaking any major habitat improvement on the refuge other than that discussed under prescribed burning above within the life of the plan. The feasibility of undertaking other forms of habitat improvement, such as chaining or crushing, is very low. Remoteness and the physical character of the refuge and costs involved in transporting equipment to project sites make such activities economically unfeasible. In addition, the legislative history of ANILCA emphasizes maintenance of natural processes in refuges. Extensive habitat improvement programs, particularly involving chaining, crushing, or other non-natural techniques, would not be consistent with this intent.

Wilderness Designation

o What will be the impact of wilderness designation on the amount of habitat and the population level of fish and wildlife on the refuge?

This is not a significant wilderness designation issue. As stated above, one of the purposes for establishing the refuge is the conservation of fish and wildlife populations and habitats in their natural diversity. Section 4(a) of the Wilderness Act states that the designation of wilderness within a national wildlife refuge must supplement the purposes for which the refuge was

established. Congressional designation of all or part of the refuge as wilderness would provide a long-term level of protection that Service management does not provide. Wilderness designation, therefore, would enhance this purpose of the refuge.

- What will be the impact of wilderness designation on the level of predator control on the refuge?

Predator control is not a significant wilderness issue. Where biologically justified and implemented in accordance with provisions of NEPA, predator control will be permitted on all areas of the refuge, including designated wilderness, regardless of management category or alternative being implemented.

- What will be the impact of wilderness designation on the amount of prescribed burning on the refuge?

Prescribed burning on the refuge is a significant wilderness issue. As discussed above, the Service has an approved prescribed burning plan for the refuge and will be undertaking prescribed burning in the future.

- What will be the impact of wilderness designation on the amount of other methods of habitat improvement on the refuge?

This is not a significant wilderness issue. Wilderness designation would preclude the use of most habitat improvement techniques (such as crushing and chaining) other than prescribed burning. As discussed above, the Service has no plans to undertake any habitat improvement activities other than prescribed fire, even in the long term. The economic and physical feasibility of undertaking such activities is not likely to change over the next 50 years.

Subsistence

Comprehensive Conservation Plan

- What impact will the comprehensive conservation plan have on subsistence hunting, fishing, and trapping levels on the refuge?

This is not a significant issue in the CCP. The continued provision of opportunities to participate in subsistence activities is a purpose of the refuge. Title VIII of ANILCA provides policy and direction on the Service's role in subsistence management and use. Subsistence use would be managed in the same manner under all management categories and in all the alternatives. The State of Alaska, through the Department of Fish and Game, regulates hunting, fishing, and trapping on the refuge. The relationship between the Service and ADF&G is a matter of policy and law and does not vary across the alternatives. Fish and game harvest regulations are set by the Alaska Boards of Fisheries and Game and administered by ADF&G. These regulations apply uniformly to all refuge lands.

- What impact will the comprehensive conservation plan have on subsistence harvest levels of refuge timber?

Harvest of timber for subsistence purposes is not a significant issue in the CCP. Subsistence use of timber would continue to be allowed in all

alternatives. Projected demand for subsistence house logs and firewood would not result in significant impacts to the timber resources of the refuge during the life of the plan.

Wilderness Designation

o What will be the impact of wilderness designation on subsistence hunting, fishing, and trapping levels on the refuge?

Hunting, fishing, and trapping on the refuge is not a significant wilderness issue. The continued provision of opportunities to participate in subsistence activities is a purpose of the refuge, even in areas of the refuge designated as wilderness. Wilderness designation would not effect state fishing, hunting, and trapping regulations or the methods by which such regulations are developed and administered. See the previous discussion under CCP. Wilderness designation does not restrict access by snowmachines, motorboats, or other means of surface transportation traditionally employed for such purposes by local residents (Section 811 of ANILCA).

o What will be the impact of wilderness designation on subsistence harvest levels of refuge timber?

Harvest of timber for subsistence use is not a significant wilderness issue. Cutting of trees for subsistence purposes, including house logs for personal use, will continue to be allowed under wilderness designation. Projected demand for subsistence house logs and firewood would not result in significant impacts to the timber resources of the refuge during the next 50 years nor would the wilderness values of the refuge be significantly altered by the anticipated level of harvest necessary to meet subsistence needs.

Fire

Comprehensive Conservation Plan

o What impact will the comprehensive conservation plan have on the level of fire protection activities (protection of private property) on the refuge?

Fire protection is not a significant issue in the CCP. Fire suppression activities are allowed in all management categories, when needed. A fire management plan for the region (Upper Yukon/Tanana planning area) has been completed, approved, and is now being implemented (AIFMC 1984). The Service has also prepared, subsequent to the regional fire management plan, a fire management plan for the refuge. These plans, and the fire management actions they identify, will continue to be implemented as approved under all the alternatives considered in the comprehensive conservation plan.

Wilderness Designation

o What will be the impact of wilderness designation on the level of fire protection activities (protection of private property) on the refuge?

Fire management is not a significant wilderness issue. Fire management actions under the Upper Yukon/Tanana Fire Management Plan and the refuge fire management plan will be the same with or without wilderness designation.

Cabins

Comprehensive Conservation Plan

- What impact will the comprehensive conservation plan have on the level of cabin construction on the refuge?

Construction of cabins on the refuge is not a significant issue in terms of the CCP. Service policy on the construction and use of cabins on the refuge will not be affected by the management alternative chosen. Service regulations on existing cabins within Alaskan refuges (50 CFR 36.33[b][1]) state that traditional and customary use of existing cabins will be allowed to continue provided their use is compatible with refuge purposes. Construction of new cabins for private recreational use is prohibited by Section 1303(b) of ANILCA. However, new cabins may be permitted if compatible with refuge purposes and if use of the cabin is either directly related to administration of the area or is necessary to provide for continuation of an ongoing activity or use otherwise allowed within the area. This policy will be carried out the same under all management categories and in all the alternatives.

Wilderness Designation

- What will be the impact of wilderness designation on the level of cabin construction on the refuge?

Construction of cabins in wilderness areas is not a significant wilderness issue. Wilderness designation would have no effect on the construction and use of cabins as outlined in the policy discussed above.

Commercial Timber Harvest

Comprehensive Conservation Plan

- What impact will the comprehensive conservation plan have on harvest levels of timber for commercial purposes on the refuge?

Harvest of timber for commercial purposes is a significant issue in the CCP. Commercial harvest of timber would be allowed in areas of the refuge under intensive and moderate management (in Alternatives B and C). Interest in such harvest has been expressed by local residents as a possible commercial activity for individuals or for village corporations and may be proposed within the life of the plan.

Wilderness Designation

- What will be the impact of wilderness designation on harvest levels of timber for commercial purposes on the refuge?

Harvest of timber for commercial purposes is a significant wilderness issue. Commercial timber harvest on the refuge has been identified as a possible economic activity for local residents or village corporations to undertake on the refuge. Proposals for this activity are likely within the next 50 years. Wilderness designation would preclude the possibility of

commercial timber harvest. In order to allow commercial timber harvest, congressional action would be required to allow commercial timber harvest in designated wilderness.

Wilderness

Comprehensive Conservation Plan

o What impact will the comprehensive conservation plan have on the amount of wilderness designation on the refuge?

Wilderness designation is a significant issue in the CCP. Section 1317 of ANILCA requires the Fish and Wildlife Service to review, as to their suitability or nonsuitability for preservation as wilderness, all lands within national wildlife refuges not designated as wilderness. Included within the comprehensive conservation plan is the Service's wilderness review for the refuge. Proposals for wilderness designation are included in each of the alternatives and the impacts of wilderness designation (or non-designation) are analyzed.

o What impact will the comprehensive conservation plan have on the quality of wilderness values on the refuge (need to protect refuge resources)?

This is a significant issue in terms of the CCP. Management activities, economic development, and other actions which may occur under the various alternatives analyzed in this document could result in impacts to various refuge resources. In turn, these impacts could effect such wilderness qualities as naturalness, opportunities for solitude, and opportunities for primitive recreation.

Wilderness Designation

o What will be the impact of wilderness designation (or non-designation) on the quality of wilderness values on the refuge?

This is a significant wilderness issue. Management activities, economic development, and other actions which may occur under the various alternatives analyzed in this document could result in impacts to various refuge resources. In turn, these impacts could effect such wilderness qualities as naturalness, opportunities for solitude, and opportunities for primitive recreation. If all or part of the refuge is designated as wilderness, many economic activities and other actions which could adversely impact these wilderness qualities would not be allowed to occur.

o What will be the impact of wilderness designation on the level of traditional activities and access on the refuge?

This is not a significant wilderness issue. Continuation of traditional activities and access on the refuge are provided for in ANILCA (subsistence use under Title VIII, access under Title XI, other activities under Title XIII). Designation of an area as wilderness does not preclude Service responsibilities to fulfill the mandates of ANILCA. Traditional activities and access will be permitted in designated wilderness as in other management categories.

Recreation

Comprehensive Conservation Plan

- What impact will the comprehensive conservation plan have on the level of construction of campgrounds and other facilities on the refuge?

Recreational use of the refuge is not a significant issue in the CCP. Recreational hunting, fishing, and trapping will be permitted subject to state and federal regulations, regardless of management category. Improved campsites would be permitted in all management categories if necessary to prevent resource degradation. Primitive camping would be permitted throughout the refuge. Recreational uses, such as backpacking, river floating, and associated activities, would be permitted throughout the refuge in all alternatives. Because of limited resources and the remoteness of the refuge, the probability of any significant growth in recreational use on the refuge is low. Currently, almost no guiding occurs on the refuge and the probability of any significant increase within the life of the plan is very low.

Wilderness Designation

- What will be the impact of wilderness designation on the level of development of campgrounds and other facilities on the refuge?

Recreational use of the refuge is not a significant wilderness issue. Wilderness designation would preclude development of most visitor facilities. There is low probability of recreational use increasing to levels which would require any visitor facilities outside of easily accessible areas (i.e., villages within or near the refuge, along the Dalton Highway). Improved campsites could be provided, including in designated wilderness, if necessary to prevent resource damage. Most recreational pursuits occurring on the refuge currently, such as backpacking, recreational hunting and fish, river floating, and associated activities, would not be affected by wilderness designation. Guiding activities are expected to remain very low over the next 50 years. Only a slight increase in recreational use is anticipated if wilderness is designated. Based on the remoteness and physical characteristics of the refuge, it is unlikely that use levels would increase over the next 50 years to the point that refuge resources, including wilderness values, would be affected or that visitor facilities on refuge lands would be necessary.

Private Lands

Comprehensive Conservation Plan

- What impact will the comprehensive conservation plan have on the level of access to inholdings and traditional use areas?

Access to inholding and traditional use areas is not a significant issue in terms of the CCP. Under Section 1109 of ANILCA, valid existing rights of access are guaranteed. Section 1110(a) allows the use of snowmachines, motorboats, airplanes, and nonmotorized surface transportation methods for traditional activities and for travel to and from villages and homesites, subject to reasonable regulation. Section 1110(b) assures that the state or private owner or occupier of state owned or privately owned land, including

subsurface rights, or a valid mining claim or other valid occupancy shall be given such rights as may be necessary to assure adequate and feasible access for economic and other purposes to these lands, subject to reasonable regulations.

- What impact will the comprehensive conservation plan have on the amount of development and use occurring on refuge inholdings?

This is not a significant issue in the CCP. Concerns related to the acquisition of private inholdings, development and use of inholdings, and cooperation with private inholders or holders of valid occupancy rights will be handled the same under all the alternatives. Common management directions relating Service management relative to cooperation with inholders and owners of adjacent lands is presented later in this document. The Service does not have the authority to regulate the use of private inholdings or use of lands where valid occupancy rights exist.

- What impact will the comprehensive conservation plan have on the amount of off-refuge development and the impacts from such development on the refuge?

This is not a significant issue in the CCP. The Service has no authority to regulate the activities on or use of lands outside the refuge. When refuge resources are adversely effected by off-refuge development, the Service will notify the appropriate agency(ies) with enforcement authority and will cooperate with said agency(ies). For example, if water entering the refuge does not meet established water quality standards the Service will notify the State of Alaska Department of Environmental Conservation (DEC) and the U.S. Environmental Protection Agency (EPA), those agencies which have the authority to enforce state and federal water quality standards. Because the Service does not have enforcement authority, it must rely on the DEC, EPA, and other agencies with enforcement responsibilities to enforce compliance with environmental laws and pollution control standards.

Wilderness Designation

- What will be the impact of wilderness designation on the level of access to inholdings and traditional use areas?

Access to inholding and traditional use areas is not a significant wilderness issue. As discussed above, there are provisions in ANILCA which ensure access to private inholdings within the refuge as well as permitting access for traditional uses of the refuge. These provisions apply to designated wilderness as well as to other refuge lands.

- What will be the impact of wilderness designation on the amount of development and use occurring on refuge inholdings?

This is not a significant wilderness issue. Wilderness designation would not affect the way the Service deals with questions associated with private inholdings. Concerns related to the acquisition of private inholdings, development and use of refuge inholdings, and cooperation with private inholders or holders of valid occupancy rights will be handled the same under all the alternatives, regardless of whether an area is or is not designated as wilderness. Common management directions relating Service management relative

to cooperation with inholders and owners of adjacent lands are presented later in this document. The Service does not have the authority to regulate the use of private inholdings or use of lands where valid occupancy rights exist.

- What will be the impact of wilderness designation on the amount off-refuge development and the impacts of such development?

This is not a significant wilderness issue. The Service has no authority to regulate the use of lands outside the refuge or the activities which occur on those lands, even if these activities are occurring adjacent to designated wilderness. When refuge resources, including resources within designated wilderness, are adversely affected by off-refuge development, the Service will notify the appropriate agency(ies) with enforcement authority and will cooperate with said agency(ies).

Mineral Development

Comprehensive Conservation Plan

- What impact will the comprehensive conservation plan have on the level of mineral development on the refuge?

Mineral development is a significant issue in terms of the CCP. Management of mineral exploration and development would be the same regardless of management category or alternative. Section 304(c) of ANILCA withdrew all public lands in each National Wildlife Refuge in Alaska from location, entry, and patent under the mining laws (hardrock minerals), but not from operation of mineral leasing laws (see Oil and Gas discussion below). Mining activity would, therefore, not be allowed on the refuge except on claims existing prior to December 2, 1980. Four mining claim case files remain in active status (BLM records), all on Chandalar Creek in the northeastern area of the refuge. There is moderate potential for more intensive mining activity to occur at these sites within the life of the plan. Such activity could result in some adverse impacts to refuge resources. The Service will monitor off-refuge mining activities to ensure that impacts to refuge resources are not occurring or are limited to the maximum extent feasible, regardless of management category.

Wilderness Designation

- What will be the impact of wilderness designation on the level of mineral development on the refuge?

Mineral development is a significant wilderness issue. No mining is allowed on designated wilderness lands with the exception of claims (if valid) existing prior to December 2, 1980. Four mining claim case files remain in active status (BLM records), all on Chandalar Creek in the northeastern area of the refuge. There is moderate potential for more intensive mining activity to occur at these sites within the next 50 years. Such activity could result in some adverse impacts to wilderness values. In addition, adequate and feasible access to valid mining claims within designated wilderness is guaranteed under Section 1110(b) of ANILCA. Such access may impact the suitability of lands for designation as wilderness. Impacts from off-refuge mining will be dealt with regardless of wilderness status, as discussed above.

Oil and Gas Development

Comprehensive Conservation Plan

- What impact will the comprehensive conservation plan have on the level of oil and gas exploration, leasing, and development on the refuge?

Oil and gas exploration, leasing, and development are significant issues in terms of the CCP. Refuges are open to the mineral leasing laws, although coal and geothermal leasing are not permitted. Refuges are, therefore, open to leasing of oil and gas and other leasable minerals. However, leasing is discretionary and dependent on compatibility. The level of activities allowed varies depending on the management category applied. Surface geologic studies and non-surface disturbing geophysical studies would be permitted in all management categories. Core sampling and seismic studies for commercial purposes would not be allowed in designated wilderness (unless undertaken by or for an Interior Department agency). Oil and gas leasing would be permitted only under intensive and moderate management. There is moderate potential for oil and gas development to occur on the refuge within the life of this plan should recoverable amounts of oil and gas be found which are economically feasible to recover.

Wilderness Designation

- What will be the impact of wilderness designation on the level of oil and gas exploration, leasing, and development on the refuge?

Oil and gas activities are a significant wilderness issue. Wilderness designation would impact oil and gas development on refuge lands. Oil and gas leasing would not be permitted in areas designated as wilderness, although geological and geophysical studies would be allowed. Seismic activities, core sampling, and other exploratory activities involving mechanized surface transportation or motorized equipment would be allowed in designated wilderness only if conducted by an Interior Department agency (or contractor for) in accordance with Section 1010 of ANILCA.

Managing the Refuge

Comprehensive Conservation Plan

- What impact will the comprehensive conservation plan have on the level of local participation in planning and management of the refuge?

Local participation in planning and management of the refuge is not a significant issue in terms of the CCP. Subsections 304(g)(4) and (5) of ANILCA require public involvement in the planning process. Specifically, Subsection 304(g)(4) states that "In preparing each plan and revisions thereto, the Secretary . . . shall hold public hearings in such locations in the State as may be appropriate to insure that residents of local villages and political subdivisions of the State which will be primarily affected by the administration of the refuge concerned have opportunity to present their views with respect to the plan or revisions." In addition, Section 2(b) of ANCSA requires that Natives have maximum participation in decisions affecting their

rights and property. The Service has sought, and will continue to seek, the input of local residents relative to the planning and management of the Yukon Flats Refuge.

This issue is related only to the CCP and will not be affected by designation or non-designation of areas of the refuge as wilderness.

SIGNIFICANT ISSUES

The following issues were determined to be significant in terms of the CCP through the preceding analysis process:

- What impact will the comprehensive conservation plan have on the amount of prescribed burning on the refuge?
- What impact will the comprehensive conservation plan have on harvest levels of timber for commercial purposes on the refuge?
- What impact will the comprehensive conservation plan have on amount of wilderness designation on the refuge?
- What impact will the comprehensive conservation plan have on the quality of wilderness values on the refuge (need to protect refuge resources)?
- What impact will the comprehensive conservation plan have on the level of mineral development on the refuge?
- What impact will the comprehensive conservation plan have on the level of oil and gas exploration, leasing, and development on the refuge?

The following issues were determined to be significant wilderness issues through the preceding analysis process:

- What will be the impact of wilderness designation on the amount of prescribed burning on the refuge?
- What will be the impact of wilderness designation on harvest levels of timber for commercial purposes on the refuge?
- What will be the impact of wilderness designation (or non-designation) on the quality of wilderness values of the refuge?
- What will be the impact of wilderness designation on the level of mineral development on the refuge?
- What will be the impact of wilderness designation on the level of oil and gas exploration, leasing, and development on the refuge?

PUBLIC REVIEW OF THE DRAFT PLAN

The Draft Yukon Flats Comprehensive Conservation Plan/Environmental Impact Statement (CCP/EIS) was made available for public review and comment early in September, 1985. A ninety day review was established. Following a restatement of the Service's policy on oil and gas exploration and leasing on National Wildlife Refuges in Alaska, a supplement to the Draft CCP/EIS was prepared and made available for public review in early December, 1985. The comment period was extended for an additional sixty days at this time. During the comment period the Service received 58 written comments from local, state, and federal agencies, industry, local interests, conservation groups, and other interested parties and individuals. These letters and the Service's responses are printed as Appendix K of this document.

Two rounds of public meetings were held in the seven local communities - Beaver, Birch Creek, Chalkyitsik, Circle City, Fort Yukon, Stevens Village, and Venetie. The first round of meetings was used to present an overview of the Draft CCP/EIS to local residents. The second round of meetings gathered public comments on the Draft CCP/EIS. An additional meeting was held in Fort Yukon which brought together representatives from all the local communities to discuss the draft plan. In addition to the public meetings, formal public hearings were held in Fairbanks (January 7, 1986) and Anchorage (January 9, 1986). A total of 57 people attended the second round of village meetings; 19 people (including representatives from each of the seven local communities) attended the Fort Yukon meeting; and 32 people attended the two public hearings with 11 people presenting oral testimony. Excerpts of the oral testimony and the Service's responses are printed in Appendix K.

Public comments on the draft plan are important because they provide an indication of the public's wishes regarding overall management of the refuge and its resources. The comments provide valuable guidance to the Service as it determines how to best manage the resources which it holds in public trust. The ultimate decision on how the refuge will be managed remains with the Service, taking into account the refuge purposes, as well as existing laws, regulations, and Service policies.

Table 2 provides an overview of public response to the five alternatives in the plan, as well as several major issues dealt with in the plan. The Service appreciates individuals' preferences, but it must be stressed that the selection of a preferred alternative is not based on how many people prefer a given alternative - public comments are only one of several criteria use in evaluating the alternatives. In using Table 2, it should be remembered that support for Alternative B reflects increased opportunities for economic development on the refuge (including commercial timber harvest and oil and gas leasing), increased potential for habitat improvement activities, and increased opportunities for recreational use with less emphasis on minimal management and preservation of wilderness values. Support for Alternative E generally reflects support for current management with emphasis on preserving existing fish and wildlife values and natural diversity by placing all refuge lands in the minimal management category and proposing that all refuge lands be designated as wilderness.

REVISION OF THE DRAFT PLAN

Based on the public comments received on and internal review of the draft plan, the following major changes have been made:

1) the Public Involvement chapter and Significant Problems chapter have been combined into a single chapter now titled Identification of Issues which allows for an analysis of all relative issues and the subsequent identification of significant planning and wilderness issues;
2) the section dealing with subsistence use, in the old Significant Problems chapter, has been deleted from the final plan;
3) data from recent studies has been added to the section on water pollution problems on Birch Creek, now in the Management Concerns section of the Identification of Issues chapter;
4) discussion of the special status of Native allotments, navigability determinations, and RS 2477 rights-of-way has been added to the Land Status section of the Affected Environment chapter;

Table 2. Analysis of public comments on the draft plan.

Comments from:	#	Alternative Supported A	B	C	D	E	No Pref.	Oil and Gas	Wilder-ness	RS 2477	Com. Timber	Mult. Use	Local Advis. Comm.	Local Hire
Federal Agencies	7	-	-	-	-	-	7	-	-	-	-	-	-	-
State of Alaska	1	-	-	-	-	-	1	1 0	-	1 0	1 -	-	-	-
Regional, Local, and Native Organizations	4	1	-	-	4	-	-	0 2	1 1	0 1	-	-	4 -	4 -
Organizations	9	-	-	-	-	4	5	1 5	5 1	0 1	-	-	-	1 1
Industry	8	-	7	1	-	-	1	7 0	0 2	-	-	5 0	-	-
Individuals														
Alaska	22	-	-	-	2	11	9	0 10	11 0	0 4	-	-	-	-
Lower 48	7	1	-	-	-	5	1	0 4	3 0	-	-	-	-	-
Total Written	58	2	7	1	6	20	24	9 21	20 4	1 6	1 0	5 0	4 0	4 0
Anchorage Hearing	5	-	2	-	-	-	2	2 1	2 1	-	-	-	-	-
Fairbanks Hearing	27	-	-	-	-	3	4	0 2	3 0	1 1	-	-	2 0	-
Village Meetings[1]	57	1	1	1	6	4	-	0 3	4 0	-	5 0	-	1 0	-

Note: Numbers listed under the various issues represent the number of people supporting (upper left) or opposing (lower right) the particular issue.

[1] Numbers represent the number of meetings where support for an alternative or views on an issue were voiced, not the actual number of people supporting an alternative or with views on an issue.

5) the public use section of the Affected Environment chapter has been changed to three separate section - Subsistence, Access and Transportation, and Recreational Use - with the Subsistence section immediately following the section on economic conditions because of the importance of subsistence as part of the local economy;
6) an expanded discussion of access and transportation relative to Title XI of ANILCA has been included in the Affected Environment chapter and in the common management section of the Management Alternatives chapter;
7) the category of designated wilderness has been added to the management categories section and the management activities table (Table 13) of the Management Alternatives chapter;
8) several changes have been made in the management activities table (Table 13) involving habitat improvement, fisheries activities, commercial timber harvest, agricultural development, and other activities;
9) common management directions have been added discussing administrative and visitor facilities and services, management emergencies, and mitigation;

10) Alternative B has been modified to reflect new information on the geologic potential for oil and gas discovery on the refuge (moderate management area has been expanded to reflect the extent of identified moderate potential with a comparable reduction in the area under minimal management);
11) the Public Use and Access Management objectives section under each alternative is now titled Recreational Use and Access Management and wording has be changed to reflect language in Title XI of ANILCA;
12) a section describing objectives relative to management of refuge resources other than fish and wildlife has been added to each alternative;
13) the Oil and Gas Management objectives section under each alternative is now titled Economic Use Management and includes discussions of commercial timber harvest and mineral development in addition to oil and gas activities;
14) scenarios describing potential prescribed burns, commercial timber harvest, mineral development, and oil and gas exploration, leasing, and development have been added, only for the purpose of impact analysis, under each alternative in the Environmental Consequences chapter;
15) an expanded discussion of fish and wildlife impacts under Alternative A has been added to the Environmental Consequences chapter;
16) wilderness impacts have been rewritten to reflect impacts on significant wilderness issues - wilderness values, commercial timber harvest, mining, oil and gas activities, and prescribed burning;
17) three tables have been added to the Evaluation of the Alternatives chapter (evaluation of alternatives based on refuge purposes and based on issues and effects of the wilderness proposals on significant wilderness issues).

The Service has made no significant changes in the five alternatives discussed in the draft CCP/EIS, except as noted above. The Service reaffirms its support of Alternative D as the preferred alternative for management of the Yukon Flats National Wildlife Refuge.

III. SPECIAL VALUES

SPECIAL VALUES

In response to requirements of Section 304(g) of ANILCA, the Service has identified the following special values of the Yukon Flats Refuge:

The White Mountains. A very scenic area of white limestone mountains lying along the southern boundary of the refuge. The mountains are isolated, receive only limited use, and remain virtually undisturbed by human development. The area also provides habitat for the only known population of Dall sheep found in the refuge. Beaver Creek, a National Wild River, is located in the White Mountains.

The Yukon River and its Tributaries. The Yukon River, along with its tributaries, provides the major transportation corridor through the refuge. Historical use of the river system for travel is evidenced by the many cultural sites found along the rivers. The Porcupine and Yukon Rivers were of particular importance in the expansion of the fur trapping and trading activities of the Hudson's Bay Company into the region in the mid-1800's. Today, subsistence activities (such as the cutting of house logs, fishing, and moose hunting) and recreational activities (primarily river floating and sport hunting) are concentrated along the Yukon and its tributaries.

Important wildlife habitat is found in association with the Yukon River and its tributaries, as well. Moose, furbearers, waterfowl, and other wildlife use the riparian/wetland areas found in association with the rivers while numerous fish species, including chum, coho, and chinook salmon, are found in the rivers. The Sheenjek River and the Fishing Branch River (headwaters of the Porcupine River) are two of the most important fall chum salmon producing streams in the entire Yukon River system. American peregrine falcons, an endangered species, are found along segments of the Yukon and Porcupine Rivers.

The Yukon Flats. Consisting generally of the wetlands and lowland lakes below the 640 foot elevation, this area is the prime waterfowl habitat on the refuge. One of the major purpose for designation of the area as a National Wildlife Refuge was the protection of this waterfowl habitat, one of the most consistent waterfowl production areas in North America. Waterfowl raised on the Yukon Flats have been harvested throughout North and Central America.

Size and Configuration of the Refuge. The refuge encompasses over 11 million acres of which 8.48 million acres (as of July 1986 Bureau of Land Management land status records) are designated as refuge lands. These are generally natural and undisturbed lands. Access to the area is limited and the refuge remains as "defacto" wilderness. Within the refuge boundary are several entire watersheds - the Hodzana, Hadweenzic, Grass, and Sucker - as well as a number of ecosystems. These areas remain in their natural condition. The opportunity to study basically undisturbed watersheds and ecosystems is provided. Historic caribou range is also found throughout much of the refuge.

The Black River Country. This area, located in the southeastern part of the refuge, is currently recognized as one of the most productive lynx habitats in the state. The Alaska Department of Fish and Game recognizes the importance of this area for lynx production and may initiate habitat and population studies in the area. Higher moose densities are found in the Black River area than in other areas of the refuge, as well.

IV. AFFECTED ENVIRONMENT

AFFECTED ENVIRONMENT

Containing the largest interior basin in Alaska, the Yukon Flats Refuge encompasses 11.18 million acres of land (8.48 million acres in federal ownership) in east central Alaska. Extending 220 miles east-west along the Arctic Circle, the refuge lies between the Brooks Range (to the north) and the White-Crazy Mountains (to the south). The "pipeline corridor" runs along the refuge's western boundary while the eastern boundary extends to within 30 miles of the Canadian border. The Yukon River bisects the refuge, creating the dominant terrain features of the refuge.

As many as 40,000 lakes and ponds may occur on the refuge, most concentrated in the flood plain along the Yukon and other rivers. Upland terrain, where lakes are less abundant, is the source of important drainage systems.

The abundance of water in lakes, ponds, and streams provides habitat for waterfowl from all four North American flyways. Though the refuge supports a varied population of mammals, fish, and birds which are important in maintaining the traditional subsistence lifestyle of local residents, it is the waterfowl nesting and rearing habitat which are of national significance. The Yukon Flats is a segment of the continental waterfowl breeding grounds almost unequaled in extent and continuous high productivity. It has been estimated that waterfowl from the Yukon Flats provide 400,000 days of recreation annually to sport hunters in Canada, Mexico, and the continental United States (USDI-BSFW 1974).

LAND STATUS

Major legislation affecting land ownership in the Alaska refuges includes the Alaska Statehood Act, the Alaska Native Claims Settlement Act of 1971 (ANCSA), and the Alaska National Interest Lands Conservation Act of 1980 (ANILCA). These laws implemented the transfer of lands from federal to state and Native ownership.

The land status of the Yukon Flats Refuge is constantly changing because lands within the refuge boundary selected by Natives and Native corporations are in the process of being conveyed, relinquished, or invalidated (rejected).

Of the 11,176,000 acres of land within the refuge boundary, approximately 8,480,000 acres (76 percent of the land within the refuge boundary) are under the jurisdiction of the federal government. Table 3 identifies how much refuge land has been selected and conveyed as of July 1986. Figure 4 shows the location of selected and conveyed lands.

As of July 1986, a total of approximately 1,734,000 acres or 16 percent of the land within the refuge boundary had been conveyed to Native corporations. This acreage includes lands conveyed to six villages and the Doyon Limited Regional Corporation.

An additional 842,000 acres or 11 percent of the lands within the refuge boundary have been selected by Native groups, Natives, and private interests. Doyon Limited has filed historical place applications (under Section 14(h)(1) of ANCSA) totaling 70,400 acres in addition to its other selections.

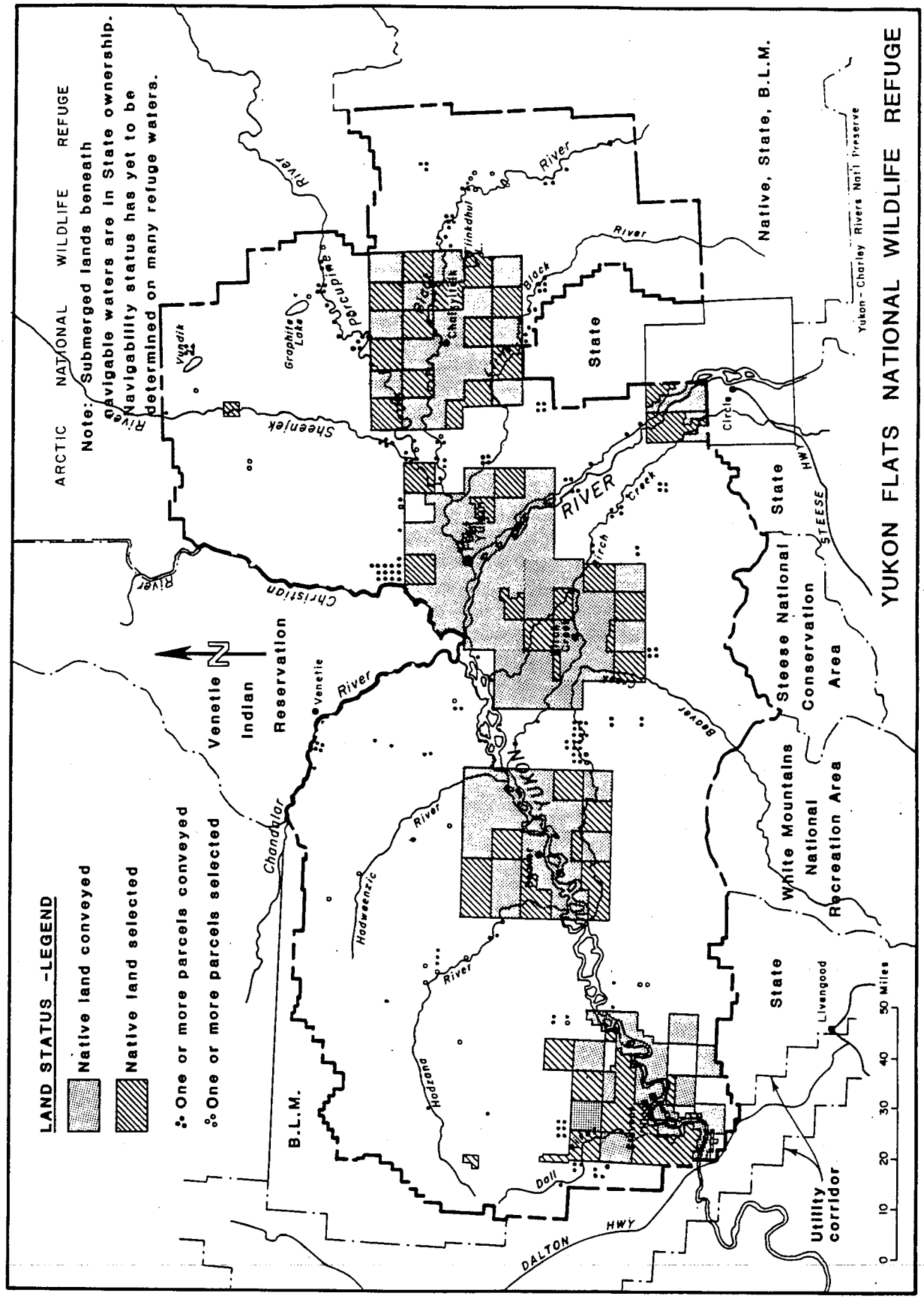
Table 3. Land status within the Yukon Flats Refuge, July 1986. Source: Realty Division, U.S. Fish and Wildlife Service, Anchorage, Alaska.

Ownership	Acres[1]	Percent of Refuge
Federal	8,480,000	75.9
Native Corporations		
Selections[2]	842,000	7.5
Conveyance[3]	1,734,000	15.5
Regional Native Corporation 14(h)(1) Selections (27)[4]	71,000	< 1.0
Native Allotments (495)	48,000	< 1.0
Private Parties[5]	500	< 1.0
State of Alaska	500	< 1.0
TOTAL	11,176,000	100

Notes:
- This table has not set out submerged lands beneath navigable and non-navigable waters. Lands under navigable waters are in State ownership. The navigability of many Yukon Flats Refuge waters has not been determined.
- The Service reserves, as part of the conveyance of lands to Native corporations, easements across these lands providing for public access to federal lands on the refuge (under Section 17(b) of ANCSA).
- The State of Alaska, under Revised Statute 2477, has identified a number of rights-of-way across federal lands within the refuge. The validity of these rights-of-way claims can only be determined in a court of competent jurisdiction.
- Venetie, along with Arctic Village, elected to acquire title to the lands which were formerly the Venetie Indian Reservation (under Section 19 of ANCSA) rather than participating in the land selection process as defined by ANCSA.
- Doyon Limited, the Native regional corporation, receives subsurface ownership of lands conveyed to the village corporations.

1 Acreages are approximate due to rounding, inaccuracies in information available, and changes in land status (e.g., relinquishment, invalidations, and conveyances of selected lands).
2 The Native corporations have overselected on the Yukon Flats Refuge. Consequently, some of these selections may be invalidated.
3 Conveyances include interim conveyances and patented lands.
4 Section 14(h)(1) selections are historic/cemetery sites that have been identified by the regional corporation (Doyon, Ltd.).
5 Private inholdings include homestead sites, trade and manufacturing sites, mission sites, Native townsites, and headquarter sites.

Figure 4. Land status, Yukon Flats Refuge, October 1985. Source: Division of Realty, FWS-Region 7.



There are 495 Native allotment applications on the Yukon Flats Refuge, totaling approximately 48,000 acres. These applications were filed under the Native Allotment Act of 1906 and were approved under Section 905 of ANILCA, although the Bureau of Land Management (BLM) has not completed pro forma notices of legislative approval for most of these applications. Trust title to these lands are granted to the individual. Under the trust title, approval of the Bureau of Indian Affairs is required prior to alienation. Requests for rights-of-way or other legal access to or through these allotments must also be approved by the Bureau of Indian Affairs. Rights to apply for allotments were repealed by the Alaska Native Claims Settlement Act.

No State of Alaska selections occur on the refuge (500 acres under State in Table 3 is the airport at Beaver). However, the State does own those submerged lands (to mean high water mark) under waters determined to be navigable. Navigability determinations have been made by the BLM on many of the waterbodies on the refuge, either as part of the conveyance process or through BLM's regional planning. Pursuant to Section 901(g) of ANILCA, those determinations are for the purpose of determining title to lands beneath navigable waters as between the United States and the State of Alaska. Waters determined navigable include: the Little Dall River (to the southeast corner of Section 30, T. 15 N., R. 8 W.); the Dall River (to site of Dall City); the Hodzana River (to Pitka Fork); the Christian River (to section line common to Sections 21 and 28, T. 22 N., R. 10 E.); the Grass River (to an unnamed tributary in Section 29, T. 20 N., R. 15 E.); all of the Yukon River and its interconnecting sloughs, the Porcupine River and its interconnecting sloughs, the Chandalar River, and the Sheenjek River on the refuge; all of Beaver Creek and Birch Creek (including the Lower Mouth) on the refuge; and the Black River and interconnecting sloughs. A number of lakes, ponds, and sloughs have also been determined navigable in conjunction with the conveyance of lands to Native corporations, though these are too numerous to list here.

PHYSICAL ENVIRONMENT

CLIMATE

The Yukon Flats Refuge has a continental subarctic climate characterized by great seasonal extremes of temperature and daylight. Fort Yukon holds the state record high temperature of 100 degrees Fahrenheit (38 degrees Celsius) and comes close to the record low at -75 degrees Fahrenheit (-59 degrees Celsius). Warm summer temperatures are augmented by essentially continuous sunlight, while extreme winter colds are prolonged by long hours of darkness.

Summer temperatures on the Yukon Flats are higher than at any other place of comparable latitude in North America. It is the only place in the world where temperatures of 100 degrees Fahrenheit (38 degrees Celsius) have been recorded north of the Arctic Circle. Conversely, the protective mountains which make possible the high summer temperatures create a gigantic natural frost pocket where winter temperatures approach the coldest of any inhabited area. Summers are cooler and winters warmer, but longer, in the uplands and mountains surrounding the Yukon Flats.

The area has a short growing season, averaging 81 days at Fort Yukon. The average date of the last killing frost in the spring is June 1, while the

average date for the first killing frost in the fall is August 21. Despite the short growing season, the long hours of sunlight produce lush vegetation on the Flats. Daylight is continuous for 84 days (illumination exceeding civil twilight), from May 13 to August 4. The sun does not rise on the shortest days of winter, but twilight lasts for several hours.

Precipitation is low, averaging about 6.5 inches annually at Fort Yukon. July and August are the two wettest months. Precipitation occurs mainly as showers, with large variations occurring over relatively short distances. Because of the accumulation of snow for over half the year, a low evaporation rate, and the presence of permanently frozen subsoil, the low precipitation is considerably more effective for plant growth than might be expected in more temperate regions.

Freeze-up of ponds and lakes usually occurs in October; the average freeze up date for the Yukon River is October 28. Break up occurs as water builds up in the headwaters and begins moving downstream. Average date of break up at Fort Yukon is May 15. Edges of small lakes and ponds may have open water a week before break up on the Yukon, but larger lakes are not free of ice for a week or more after the Yukon.

Extensive flooding of lowland areas frequently accompanies break up. This flooding is the primary source of water for many of the lakes in the Yukon Flats, as precipitation is insufficient to maintain water levels.

TOPOGRAPHY

The refuge includes three features: the Yukon Flats at the center, surrounding uplands, and all-encircling highlands.

The Yukon Flats, consisting of about 6.5 million acres, is mostly flat to undulating lowlands dotted with shallow lakes, sloughs, and meandering and braided streams. Elevation is about 300 feet in the west and 600 to 900 feet in the north and east. Local relief, on flood plains, well-developed river terraces, and alluvial fans, generally does not exceed 150 feet (Williams 1962). The Yukon River is the principal drainage. It drops only about 200 feet in elevation in 300 miles as it meanders across the Yukon Flats as a complexly braided stream. The lower stretches of the Yukon's tributaries are intricately braided streams with meandering channels, swelling in flood stage to a labyrinth of reticulated waterways (particularly those streams draining the areas south and east of the Yukon).

The Yukon Flats are surrounded by older river terraces, alluvial fans, and flood plain deposits that rest on bedrock. These deposits are mostly flat lying and are separated from the Yukon Flats by a 100- to 500-foot high marginal escarpment (Williams 1962). Overall topography is that of a rock-floored bench, covered with gravel and silt. These deposits are largely dissected by erosion on the north and west, but are somewhat preserved on the south and east. Elevations do not generally exceed 1,200 to 1,300 feet.

Encircling the Yukon Flats are highlands and mountains. The Porcupine Plateau, an area of low ridges with gentle slopes and rounded to flat summits, lies along the northern and eastern boundary of the refuge. Elevations reach to 2,500 feet with a few domes and mountains rising to 3,500 feet. The Chandalar, Sheenjek, and Coleen Rivers drain the northern portion of the plateau; the Black and Little Black Rivers, which originate in the Ogilvie Mountains southeast of the refuge, drain the area south of the Porcupine River. Along the western boundary of the refuge are the Hodzana Highlands, an area of

4,000-foot ridges drained by the Hadweenzic, Hodzana, and Dall Rivers. The eastern Brooks Range lies north of the Hodzana Highlands and Porcupine Plateau, north of the refuge boundary. Bounding the Yukon Flats to the south is the Yukon-Tanana Uplands, of which the White and Crazy Mountains are the northern extension. Summits in the White and Crazy Mountains range from 4,000 to 5,000 feet in elevation. Birch and Beaver Creeks are the major drainages on the northern side of these mountains.

GEOLOGY

The Yukon Flats Refuge is located at the intersection of two major fault systems--the Porcupine-Kaltag fault system (which parallels the Porcupine River and the Rampart section of the Yukon River) and the Tintina fault system (which extends from the southwest part of the refuge some 600 miles south-southeast paralleling the Yukon upstream from Circle) (Barker 1981). These faults, combined with the presence of river canyons and coal beds in the adjacent uplands, indicate that the basin is structurally caused (Miller et al. 1959). Earliest known subsidence in the basin occurred about 40 million years ago (late Eocene). More recent subsidence is evidenced by the escarpment surrounding the Yukon Flats. Lake impoundment probably occurred following subsidence, as indicated by the presence of quiet-water sediments of the Pliocene-Pleistocene age (4 million years ago) in a drill hole at Fort Yukon.

Besides subsidence by faulting, regional warping probably occurred. Warping may explain the anomalous drainage in the Yukon Flats. The flats have a westward "tilt" with the Yukon River draining southwestward. However, the Yukon's tributaries have a "backhand" drainage pattern (Mertie 1937). From the north, the Hodzana, Hadweenzic, and Chandalar rivers flow southeastward at right angles and in reverse direction to the flow of the Yukon. The upper courses of the tributaries to the south, such as Beaver and Birch creeks, flow northeast in the same backhand manner before turning westward and paralleling the Yukon prior to joining that river. The Yukon, as it exits the refuge, is in a youthful position--downcutting through bedrock. These and other features, including the successively lower elevations eastward of the Chandalar, Christian, Sheenjek, and Coleen river drainage divides, indicate that the Yukon Flats area previously drained eastward through the Porcupine valley to the Arctic Ocean. The area was subsequently upwarped and locally downwarped, resulting in the westward tilt of the area today (Mertie 1937).

The sediment infilling of the Yukon Flats probably occurred during the Pleistocene age. Presently, the Flats are in a state of destruction. Sediments are being excavated as the base level of erosion is lowered with the cutting of bedrock by the Yukon River below Stevens Village. Sediments are not being replenished by deposition of new materials (Mertie 1937). Figure 5 shows the geology of the Yukon Flats Refuge.

Bedrock Geology. Geologic exploration of the area shows a complex assemblage of diverse rock types, stratigraphic sequences, fossil faunas, and structural styles. All geologic time periods are recognized, including one of the most complete, continuous, and fossiliferous sequences of Proterozoic to Lower Paleozoic carbonates in North America. Other rock types include mafic igneous rocks, nonmarine clastics, and oceanic, arc trench and continental margin sediments. Many of the stratigraphic relationships in the area are not well explained by faulting or facies changes. Both the types of structural

deformation in the area and the wide variations in stratigraphies are more accurately considered as belonging to separate entities called terranes rather than as vaguely related parts of a single geologic domain.

The Yukon Flats Refuge includes both in-place continental rocks and drifted and welded accretionary terranes. Underlying the Porcupine Plateau are primarily in-place undeformed and unmetamorphosed sediments (Paleozoic and Mesozoic clastic and carbonate rocks) lying in an undisturbed position over a crystalline basement. Bedrock over the rest of the refuge is found in a number of accretionary terranes, is tectonically disturbed, with widely divergent rock types in crushed, mixed, and metamorphosed assemblages.

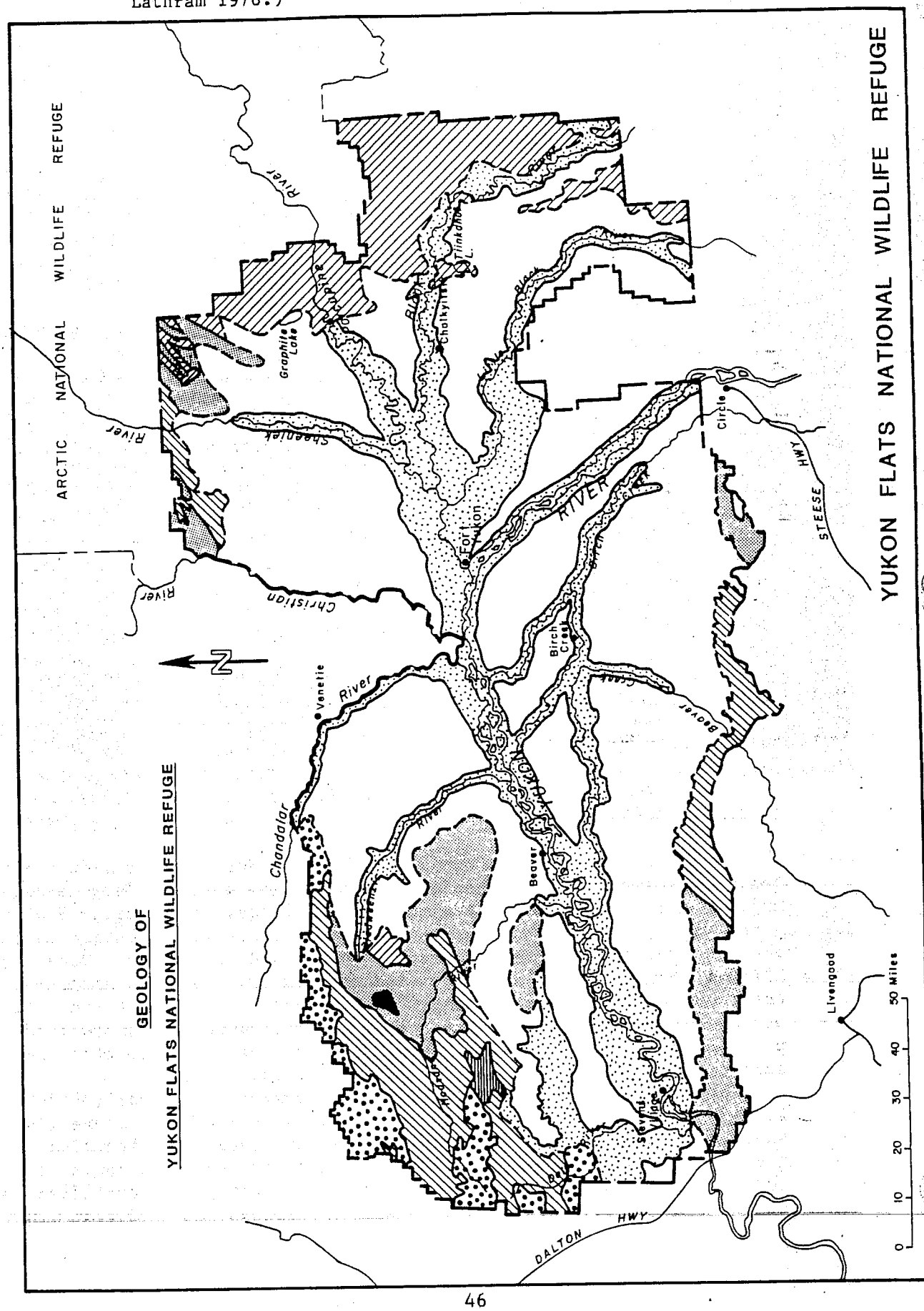
Bedrock in the Porcupine Plateau is generally limestone, chert, sandstone, argillite, siltstone, and shale. Bedrock in the highlands north of the Yukon Flats and west of the Porcupine Plateau is mainly metamorphic and volcanic, including schist, phyllite, basalt, diabase, and gabbro. Throughout the Hodzana Highlands these latter rocks are intruded by Cretaceous granite. Locally they include light-colored Cretaceous and Tertiary volcanics at Lone Mountain and iron/magnesium-rich igneous rock at Twin Sisters. In the White-Crazy Mountains along the southern boundary of the refuge are highly deformed Paleozoic sedimentary and volcanic rocks. Conspicuous limestone units here have been overturned and thrust to the north. The White Mountains are thus aptly named, for these distinctive white limestone outcroppings occur throughout the range. Bedrock between the mountains and the flats crop out only in gullies and along the escarpment. They are, except for a coaly Eocene sediment in the upper Dall River area, similar to those in the mountains. The coal probably represents the beginning of subsidence of the Yukon Flats basin.

A mosaic of 17 terranes emerges from the relationships between the severely deformed metamorphic rocks, mafic oceanic rocks, and continental margin sequences mapped in the area. Nine of these terranes or microterranes are identified in or contiguous to the Yukon Flats Refuge. Two of these terranes, the Yukon Basin and Tatonduk, are considered important as possible oil and gas sources. The White Mountains, Crazy Mountains, Takoma Bluffs, and Beaver terranes are predominantly sedimentary assemblages which could be favorable for oil and gas reserves, but have limited areal extent along the boundaries of the refuge. The Tozitna, Ruby, and Circle terranes are predominantly volcanic, mafic, oceanic, or metamorphic with low oil and gas potential.

Surficial Geology. On the Yukon Flats, underlying the modern river flood plain alluvium, the most extensive deposits are alluvial fans deposited by major streams during the Pleistocene glacial age. The largest fans were generated by tributaries from the north, which carried abundant loads of outwash from glacial deposits in the southern Brooks Range. More recent alluvial fans drain locally from the uplands and along the escarpment north of the Yukon Flats, most extensively in the west. Deposits of wind-blown sand, probably dating from the glacial age, occur in dune fields above the flood plain north of the lower Yukon River and in broad blankets flanking higher terraces and parts of the upland farther north.

Uplands south of the Yukon River are covered with loess (wind-blown glacial flour) up to 100 feet (30 m) thick, probably of the Pleistocene glacial age. Dune shape and sediment size distribution indicate wind direction was from the Brooks Range glaciers to the north. Underneath the loess south of the Yukon, and laid bare in areas of the uplands to the north, are stratified locally-cemented deposits of sand, silt, and gravel as much as 100 feet (30 m) thick.

Figure 5. Geology of the Yukon Flats Refuge. (Source: Beikman and Lathram 1976.)



LEGEND

GEOLOGY OF YUKON FLATS NATIONAL WILDLIFE REFUGE

SURFICIAL DEPOSITS IN YUKON FLATS CENOZOIC BASIN

Recent	modern river alluvium
Pleistocene and earlier	alluvial fans

BEDROCK OF ENCIRCLING HIGHLANDS

edge of highlands

Tertiary and Cretaceous	felsic volcanic rocks; rhyolite, porphyry, and breccias
Cretaceous	granitic rocks; monzonite and quartz monzonite
Permian to Jurassic	mafic volcanic rocks; basalt, gabbro, etc.
Permian to Jurassic	ultramafic rocks; serpentinite
Lower Paleozoic and Precambrian	metamorphic rocks; chiefly schist and phyllite, includes White Mountains assemblage
Lower Paleozoic and Precambrian	sedimentary rocks; shelf and slope carbonates and clastics, includes Quarternary volcanics east of Chalkyitsik

No glacial deposits extend into the refuge, though recognizable moraine remnants and erratics of up to four separate glaciations occur north of the refuge.

Though not exposed, lake deposits may underlie the Yukon Flats. At least 290 feet of quiet-water, fine-grained sediments of the Pliocene-Pleistocene period have been encountered below 150 feet (45 m) of stream alluvium while drilling a water well at Fort Yukon. These sediments suggest that a lake formed on the Yukon Flats during subsidence.

SOILS

The soils on the Yukon Flats Refuge have been field-mapped by the Soil Conservation Service (SCS) at a scale of 1:500,000, based on periodic onsite examination. Areas of consistent soil patterns were identified and related by landform and vegetative cover. Their distribution, as soil subgroups, are shown by Rieger and others (1979) at a published scale of 1:1,000,000.

Soil types found in the upper Yukon-Porcupine area vary considerably. Wet, loamy soils overlain with a thick peat layer and a shallow permafrost table are common. Such associations occupy broad lowlands adjacent to the Yukon and tributaries such as the Chandalar, Sheenjek, and Porcupine rivers. Peat deposits are also found in conjunction with these soils. Interlayered silty and sandy soils occupy broad flood plains in the Yukon Flats.

Wet, loamy soils are also found on upland sites, though these are generally better drained. Very gravelly and stony loams of variable drainage occupy hillsides, steep slopes, and ridgetops bordering the Yukon Flats. Well-drained brown loams are found on hills and ridges of the Porcupine Plateau and on the uplands both north and south of the Flats. Gray calcareous loams are also present on the terraces and hills of the Porcupine Plateau.

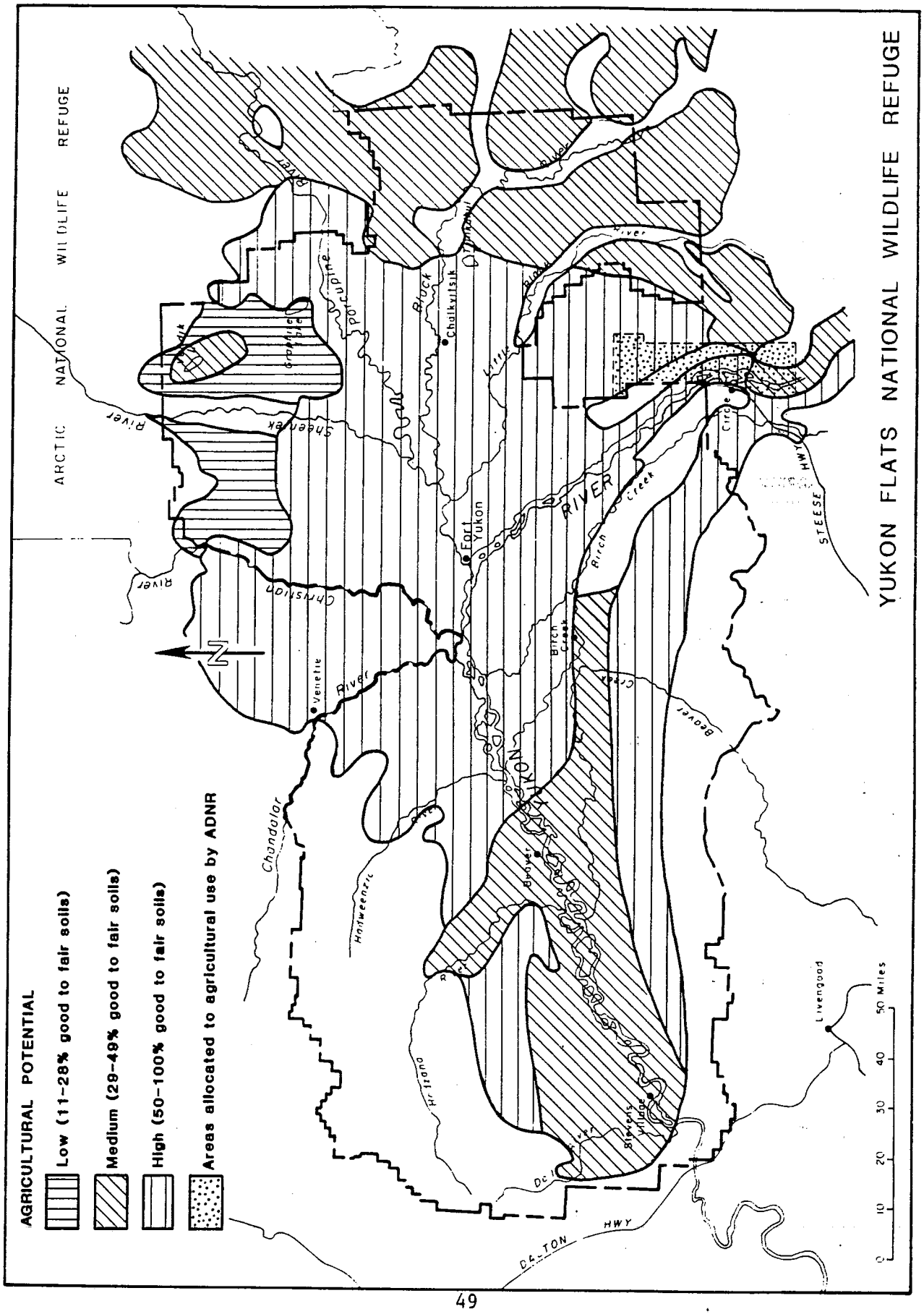
Agricultural Potential. Several million acres of agriculturally suitable soils are present in the vicinity of the Yukon Flats. Warm summer temperatures and extended daylight are conducive to growing a variety of crops.

ANILCA recognizes the agricultural potential of lands in the Yukon Flats Refuge. Section 1324 states that "Nothing in this Act or other existing law shall be construed as necessarily prohibiting or mandating the development of agricultural potential within the Yukon Flats National Wildlife Refuge . . . permissibility of such development shall be determined by the Secretary (of the Interior) on a case-by-case basis . . ."

According to the SCS 1979 soil survey, the upper Yukon-Porcupine area contains about 5.5 million acres of soils suitable for agricultural development. Figure 6 shows the soils on the refuge classified as suitable for agricultural development in a study prepared by Greater Water Associates for the Alaska Department of Environmental Conservation and the U.S. Department of Agriculture, SCS. Approximately one quarter of this acreage is climatically marginal for agriculture, due primarily to high elevation and the probability of summer frosts. Early grains tested in the area have produced well. Some subsistence gardening is done at Fort Yukon and other communities in the region. No commercial agriculture operations occur within the refuge boundaries at this time.

A significant portion of the agriculturally suitable soils on the refuge occur on lands selected by Native regional and village corporations. Potentia agricultural developments would, in all likelihood, occur on Native-owned lands if they were to occur.

Figure 6. Soils suitable for agricultural development. (Source: Greater Water Associates 1982.)



Several major limitations to agricultural development in this area are present. Summers are short with growing seasons generally less than 90 days; winters are extremely cold; frequent seasonal flooding occurs; precipitation is low thus necessitating irrigation; and intermittent or discontinuous masses of permafrost underlay most suitable soils all affect the potential agricultural development in the region. In addition, soils are generally low in nutrients, requiring the use of various soil supplements. Other factors, such as distance from potential markets and sources of supply and the lack of a transportation system in the region, are also important considerations in whether or not agricultural development will occur in the region.

MINERALS

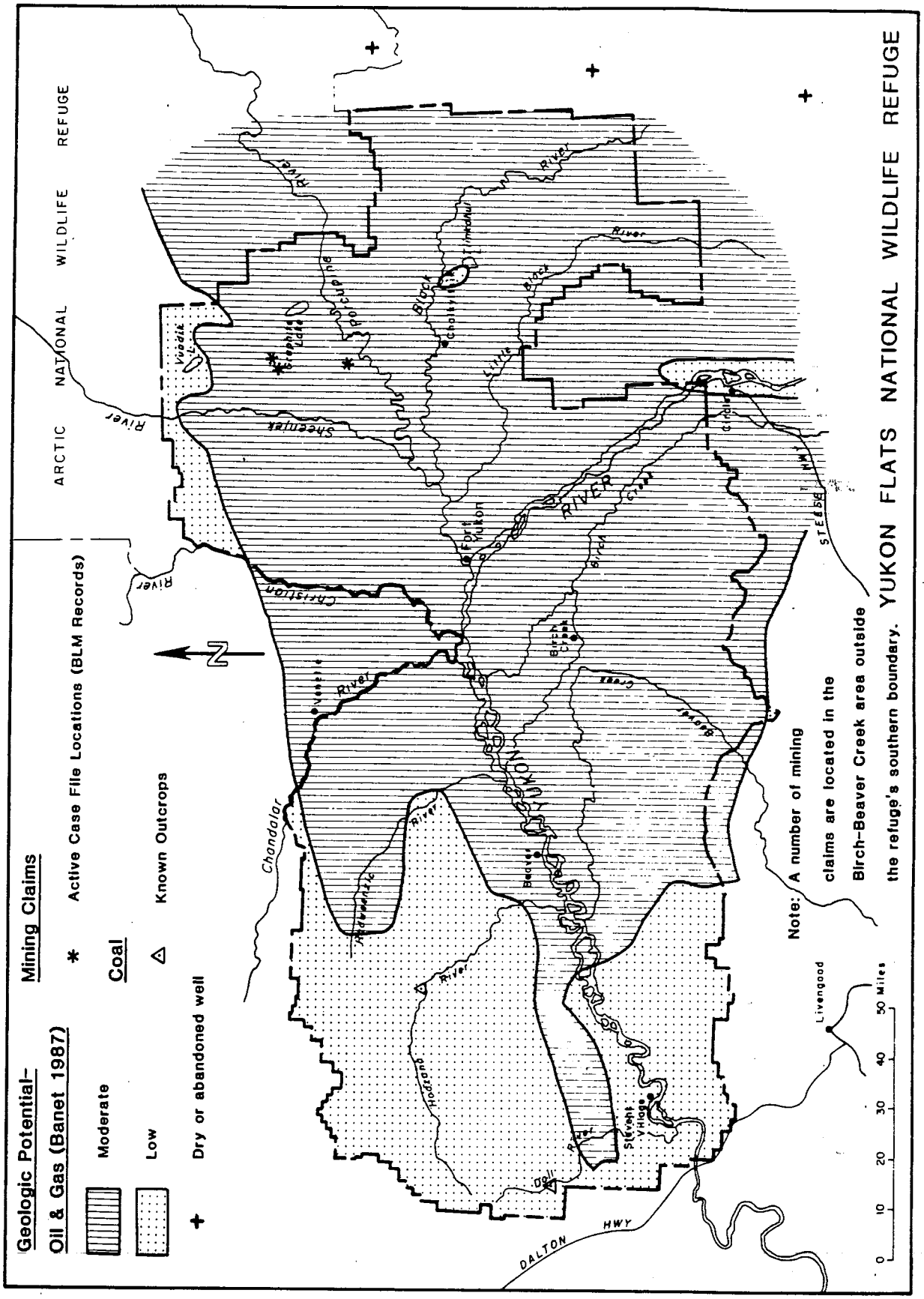
Though some very tentative estimates of mineral potential in the region can be made, there is a lack of the extensive geologic mapping, sampling, and drilling that an accurate assessment requires. Until more exploration is undertaken, discussion of mineral resources must be based on the limited information that is available.

Metallic Minerals. Gold has been the only major commodity mined in the region. Extensive placer mining has occurred in the Rampart mining district west of the refuge, in the Circle and Tolovana districts to the south, and in the Chandalar district to the northwest (where lode deposits containing gold, iron, and zinc have also been developed). Most known mineralized areas occur outside the refuge--in the vicinity of the upper Sheenjek and Porcupine rivers, near Rampart, and in the White Mountains. As most of the early prospecting was for placer gold, many of the drainages entering the refuge were worked. Gold-bearing gravels, but no workable placers, were reported on Beaver, Victoria, and Preacher creeks and on the upper Dall River. A large number of known mineral occurrences and deposits are present on the refuge according to information provided by the Bureau of Mines. However, only a limited number of these prospects have been worked (assessment work reported) in recent years. According to Bureau of Land Management records (as of May 20, 1987) there are a total of 332 mining case files on record for the Yukon Flats Refuge. Of these cases, 328 are closed files, none of which were patented or went to mineral survey. Only four case files are in an active status - all on Chandalar Creek in the northeastern area of the refuge. These are the only claims where mining activity can occur on the refuge. A number of other claims, primarily located along the refuge's southern boundary (outside the refuge) in the Mt. Schwatka, Preacher Creek, and Rock Creek areas are not active locations (latest reported assessment work was 1983 or earlier). Location of claims in active case files is shown on Figure 7.

Because mineral development is in its early stages in Alaska, activities have focused on minerals of high economic value such as gold, silver, mercury, platinum, and high-grade copper. The delineation of major metal provinces, therefore, has been influenced by knowledge of these minerals and their potential economic return. The White Mountains along the southern boundary of the refuge and the Ray and Davidson mountains in the Brooks Range north of the refuge are included in provinces of potential economic importance for tin, gold, silver, lead, zinc, and tungsten. None of the highland areas of the refuge have been adequately explored to determine possible mineral resources.

Certain types of bedrock and bedrock relationships in the refuge are more favorable than others for metallic mineralization. Volcanics in the

Figure 7. Yukon Flats oil and gas potential, known coal outcrops, and active mining claims. (Sources: Banet et al. 1987, Barker 1981, Bureau of Land Management mining recordation files-May 20, 1987.



White-Crazy Mountains and Hodzana Highlands are characteristic of types having potential for lead, zinc, copper, and other base sulphide mineralization. Particular occurrences of lead, zinc, and other mineralization were found in the Mt. Schwatka area (Barker 1980), and several hundred lode claims were subsequently staked there and southward. Anomalously high concentrations of cobalt and other metals were found in geochemical samples in the hills west of Preacher Creek (Barker 1984). In the Hodzana Highlands, felsic granite intruding calcareous schist has potential for precious and base metals. Occurrences of tungsten and tin are known in the refuge and westward. Above Caribou Bar extensive mineral investigation was carried out for possible Native selection; however, most Native rights in this area have subsequently been relinquished. East of Caribou Bar are felsic volcanics constituting source rock, and probably adjacent carbonaceous sediments constituting potential host rock, for uranium. Other evidence indicative of uranium in the vicinity is given by Barker (1981). Another rock type, high in iron and magnesium and having potential for chromite, nickel, and asbestos, occurs east of Mt. Schwatka and in the northwest near Twin Sisters.

Presently no hardrock (lode) mining is occurring on the Yukon Flats Refuge. Small scale placer mining is the only regularly occurring mining activity in the vicinity of the refuge.

Coal. Tertiary age coals (ranking from high grade lignite to low grade subbituminous) is found in several locations outside the refuge--near Rampart and on the Ray and Tozitna rivers to the west and near Circle and Eagle to the southeast. Coal is found in two areas on the refuge--on the Hodzana and upper Dall rivers (Figure 7). While most surface exposures are limited to rubble and float, one five-foot thick coal bed outcrops in a bank of Coal Creek, a tributary of the Dall River. Nearby, two U.S. Bureau of Mines auger holes encountered coal beds 12 and 18 feet thick (Barker 1981). On the Hodzana River, near the Mudbank below Pitka Fork, coal seams up to one foot thick are exposed. Additional subsurface sampling is necessary to determine the areal extent and number and thickness of coal beds, though the extent of relatively flat-lying sedimentary rocks which could contain the coal can be judged from the topography of the area to be about 150 square miles between the two areas (Williams 1962).

Oil and Gas. The geology of the Yukon Flats area is complicated, consisting of several distinct litho-stratigraphic units - terranes - along two major fault systems. Outcrops found in the area show the effects of the two major faults. Most bedrock exposures are sub-parallel to the main fault systems, but are typically cut off or additionally deformed by second and third order thrust faults, folds, and normal faults.

The Yukon Basin, an oil and gas basin delineated by Ehm (1983), extends over much of the southern and eastern portion of the refuge. By definition, any area of sedimentary rocks of sufficient volume, depth, and areal extent to have accumulated and trapped petroleum is called an oil and gas basin. Tertiary sediments are likely as the Yukon Flats appears to be a structural basin, unlike many other Alaska topographic basins. Paleozoic sediments are included in the east because they are unmetamorphosed shelf and slope types. Two deeper parts were identified, one across Beaver Creek, the other across the Black River. Two different rock types are involved: Tertiary sediments of the Yukon Flats Cenozoic basin to the west and Paleozoic shelf and slope sediments of the Porcupine Plateau to the east. The Tertiary sediment prospective petroleum horizon is approximately the Cenozoic basin floor, and

Paleozoic sediment contours are drawn as deep as reasonable above granite or other crystallines. (Note: The basin configuration delineated by Ehm is only one possible interpretation, based on a limited amount of preliminary data - magnetic and gravity data limited by what is apparent from surface geology. Revisions incorporating more definitive data may result in significant changes in the basin configuration.)

Geophysical - Publicly available geophysical data on this area consists of two partial aeromagnetic surveys, a Bouger Gravity survey, and a single CDP seismic line shot immediately east of the refuge's east boundary and west-southwest of the Doyon No. 2 well (Ehm 1983 in Banet et al. 1987). This line crosses the Takoma Bluff terrane and an alluvium-covered area possibly overlaying some Tertiary rocks. Reflector continuity is poor on the line, but there is enough coherence to show some southward vergence, a possible indication of thrust faults emplacing older rocks over younger rocks. There is no clear indication of Tertiary rocks or distinct terrane junctures.

The two aeromagnetic surveys (Decker and Karl 1977 in Banet et al. 1987) show shallow-seated anomalies in the west part of the refuge and deep anomalies in the east. The shallow, positive anomalies appear to be buried extensions of the Tozitna terrane (predominantly volcanic, mafic, oceanic, or metamorphic with low oil and gas potential). This enlarges the area of low potential for petroleum discovery (Figure 7) at the expense of the moderate potential area. Also, the deep-seated positive aeromagnetic anomalies identified in the eastern part of the area partially coincide with the Bouger Gravity minimums in the area north of Circle. These possibly indicate thin veneers of sediment and possible basement uplift.

The Bouger Gravity survey identifies several minimums. One minimum, some 40 miles south-southwest of Fort Yukon, is of similar setting and magnitude to a minimum tested by the Doyon No. 1 well. Doyon No. 1 encountered 11,044 feet of Lower Paleozoic to Cretaceous sediment. The Fort Yukon low should also indicate a thick sedimentary sequence, although possibly not as thick since rock densities are probably dissimilar. Bouger Gravity minimums northwest of the refuge are associated with Cretaceous granite plutons, not sediments.

Geochemical - There are no published quantitative geochemical analyses to demonstrate source rock potential in this area. However, certain Tatonduk terrane rocks were found to have a strong petroliferous odor upon fresh fracture (along Yukon River southeast of refuge). Oil seepage has been reported along Trout Creek (southeast of refuge) (Morgridge personal communication in Banet et al. 1987). Oil shale lithologies have been described near Nation (Mertie 1937 in Banet et al. 1987). The lithology and fossil assemblages of the lower part of the Glenn Shale (in the Tatonduk terrane) show that it is laterally equivalent to the Shublik Formation, a demonstrated North Slope petroleum source rock. These qualitative observations, combined with limited unpublished proprietary surface outcrop geochemical data indicate that potentially petroleum-bearing rocks types have been deposited and are at least partially preserved in the region east of the refuge.

These observations also show that at least the Glenn Shale and younger rocks are within the physical-chemical oil generating and preserving constraints (oil window) in this area. Most of interior Alaska Lower Paleozoic carbonates are at thermal maturities exceeding the base of the oil preservation window, although these thermal maturities are less closer to Canada where oil and gas have been recovered (Blodgett 1978 in Banet et al. 1987).

Less available geochemical data is available for the Tertiary rocks of the Yukon Basin. Outcrops of rocks are mostly nonmarine; are rich in coaly organic carbon; and are, therefore, likely to generate gas upon reaching sufficient thermal maturity. North of the basin, isolated patches of Tertiary rocks in the Ruby and Tozitna terranes are at least partially tectonically deformed, indicating that they have been buried deep and long enough to coalify the plant material to the lignite or subbituminous coal rank.

Subsurface temperatures in the Doyon wells east of the refuge indicate low geothermal gradients. As geologic histories of the rocks where these temperatures were recorded are complicated, simple petroleum generation time-temperature reconstructions cannot be made. However, the low temperatures indicate that oil and gas can be preserved to depths of at least 20,000 to 25,000 feet at the present temperature regime.

The only drilling within the Yukon Flats Basin has been a 400-foot-deep water well for Fort Yukon, which may not have reached the Tertiary section. If marine Miocene age source rocks exist in the Yukon Flats Basin, as has been suggested (Miller et al. 1959 and Brosge 1973 in Banet et al. 1987), the geophysical surveys indicate that the strata should be within the range of depths for petroleum generation to begin, and that the entire sedimentary section should be within the range of depths to preserve petroleum. However, until data on sediment types, rates of deposition, and geothermal gradients within the basin are available, time-temperature reconstruction of source rock burial history are speculative and based on analogies to other similar basins.

Summary - In summary, qualitative observations and proprietary information suggest that organic rich source rocks exist in the Tatonduk terrane rocks. Although many of the carbonates are beyond the petroleum generating stage of thermal maturity, Upper Paleozoic carbonates and clastic rocks have indications, ranging from strong petroliferous odors to oil seepages, that hydrocarbons have been generated and preserved. The lithology of nearby Tertiary rocks and geophysical surveys indicate that burial conditions exist that are favorable for the generation of gas (and possibly for liquid hydrocarbons) within the Yukon Flats Basin. In addition, the Late tertiary through Quaternary deformation phases of the Kaltag-Porcupine fault zone have most likely created structures to trap hydrocarbons.

The available data show that the Yukon Flats Basin and surrounding area is similar to other interior Tertiary basins in Alaska. These basins are arealy large, remote, and mostly unexplored for oil and gas, having few drill holes and large sized tracts of untested land. The closest discovery wells are in the Eagle Plain Basin in the Yukon Territory, Canada, where oil and gas have been tested, but as yet not economically produced from Tatonduk terrane rocks.

Figure 7 shows the petroleum potential for oil and gas discovery for the area, based on the Bureau of Land Management's Mineral Potential Classification System. These classification are only relative to specific areas owing to differences in the quality and quantity of data available for a given area. The area of moderate potential is based on the direct evidence of the outcrop of sedimentary rocks of Tatonduk and adjoining predominantly sedimentary terranes and the inferred extent of sedimentary rocks in the Yukon Flats Basin, based on the geophysical surveys and qualitative geochemical data. The low potential areas are based on direct evidence from the outcrops of metamorphic rocks, severely altered sediments, mafic rocks, and igneous rocks exposed at the surface, or inferred indirectly to be buried beneath a relatively thin layer of sediments from the geophysical surveys. The extent

of shearing and thrust faulting of low potential terranes over the sedimentary terranes is unknown. It is incorporated with the low potential area until further data are available, as the physical conditions created during extensive shearing and thrust faulting are not favorable to the preservation of hydrocarbons.

Note: Much of the information presented above can be found in greater detail in Petroleum Geology of the Yukon Flats National Wildlife Refuge (Banet et al. 1987), a report prepared by the Bureau of Land Management for the U.S. Fish and Wildlife Service. This document is available for public review at the Yukon Flats National Wildlife Refuge headquarters in Fairbanks, Alaska, and at the USFWS Regional Office in Anchorage. A limited number of copies are also available on request at the Regional Office.

Geothermal Resource. Evidence of possible geothermal resources within the refuge is limited. Hot springs occur near the Dall River (in T. 16 N., R. 10 W., Sec. 7, F.M. and T. 16 N., R. 11 W., Sec. 12 and 13, F.M.) (Gassaway and Abramson 1978). No studies to determine the potential for use of these hot springs have been undertaken.

Other Minerals. Alkali salt is contained in many of the lakes on the refuge. These lakes are recognized by the milky white color of their water and by evaporative crust on dried-out beds. Analysis of samples from the lakes identify this alkali material to be primarily trona (Clautice and Mowat 1981), a sodium bicarbonate industrial mineral used in the manufacture of glass and paper. Source of the trona is suggested to be groundwater emanating from supposed evaporative beds at depth. Such beds could be speculated from an ancient evaporated lake, now buried (Barker 1981), however, no trona beds are known. Bicarbonates and carbonates have been correlate with productivity in freshwater lakes (Moyle 1970).

The felsic volcanics around Lone Mountain may include water-laid tuffs and ash falls (Barker 1981). Such deposits may contain zeolite, a group of hydrous aluminum silicate minerals important in industry as a water softener. No deposits are known and most of the rock in the area is rhyolite (Brosge et al. 1973).

Sand and gravel, which are found in abundance on the refuge, are too remote to be marketed economically.

WATER RESOURCES

Lakes, sloughs, and streams dominate the landscape of the Yukon Flats Refuge. There are an estimated 17,000 lakes and over 7,100 miles of rivers and streams (from Landsat imagery). Other sources, including the 1974 BSFW EIS for the proposed Yukon Flats National Wildlife Refuge, estimate the number of lakes on the refuge upwards of 40,000 and stream miles as high as 25,000. The variation in estimates of lake numbers is caused by several factors. Water levels on refuge wetlands fluctuate seasonally as well as yearly. Estimates of lake numbers have been based on samples, not on actual counts. Landsat counts lakes, but because of technical limitations misses some waterbodies. The abundance of water features has a major impact on the fish and wildlife populations, human use, and management of the refuge. Surface water provides for such diverse purposes as domestic and institutional uses, navigation, sites for small aircraft landings, fish and wildlife habitat, and recreation.

Watersheds. The refuge lies within the drainage basin of the Yukon River, the fifth largest river in North America. Entering the refuge along its southern boundary approximately 10 miles downstream from Circle, the Yukon flows northwesterly in a braided channel for some 60 miles to Fort Yukon, then bends and flows southwest for another 240 miles in a meandering course with many sloughs before leaving the refuge in a narrow valley between the Ray and White Mountains.

The Porcupine River is the major tributary of the Yukon River in the refuge, joining the Yukon just downstream from Fort Yukon. The Porcupine and its tributaries--which include the Sheenjek, Black, Little Black, Sucker, and Grass rivers and Chandalar Creek--drain the eastern portion of the refuge. Headwaters of the Sheenjek are in the eastern Brooks Range (Davidson Mountains) while the Black and Little Black have headwaters in the Ogilvie Mountains and southern portion of the Porcupine Plateau. The Sucker and Grass rivers and Chandalar Creek drain areas almost entirely within the refuge.

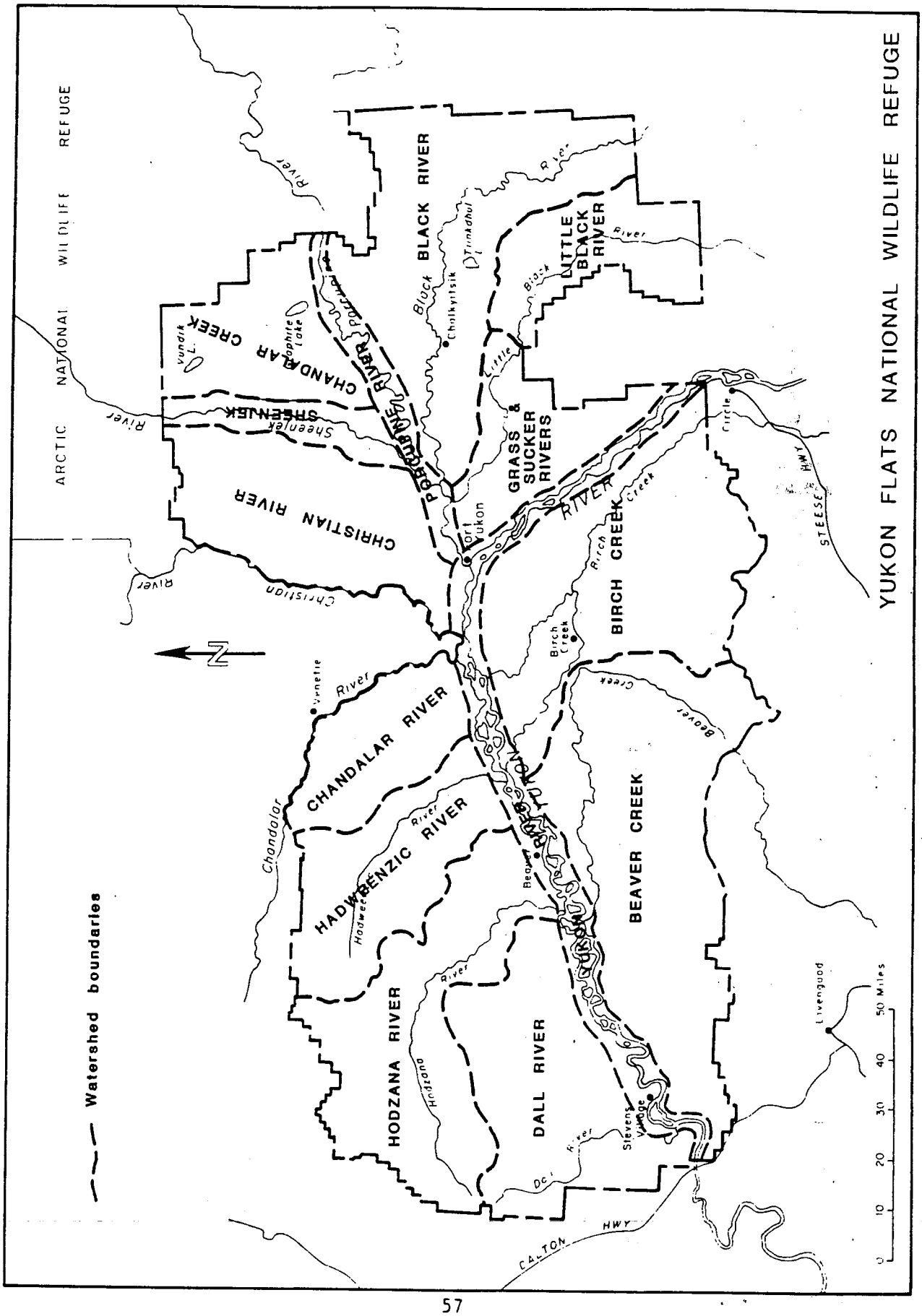
Other important tributaries of the Yukon within the refuge include the Chandalar and Christian rivers which drain the southern slopes of the Brooks Range and the western portion of the Porcupine Plateau; the Hadweenzic, Hodzana, and Dall rivers which drain the Hodzana Highlands and eastern slopes of the Ray Mountains; and Birch and Beaver creeks which drain the White and Crazy mountains. Birch and Beaver creeks flow onto the Flats from the south, while the others flow into the Yukon from the north. These waters, except for the Christian River, have been identified as important salmon spawning and rearing habitat.

Rivers flowing into the north side of the Yukon are generally swift and contain numerous islands and gravel and sand bars. Many oxbow lakes and ponds have formed along these rivers, but upstream areas are generally drier than the remainder of the Yukon Flats. Birch and Beaver creeks, on entering the Yukon Flats, bend westward and parallel the Yukon for many miles. Oxbow lakes are less numerous, but other lakes are abundant and provide some of the most productive waterfowl habitat on the refuge. Lakes on the refuge are generally classified as foothill lakes (formed from streams, generally deep, and suitable for fish habitation), tundra lakes (usually shallow and often freeze to the bottom, and lowland lakes. Lowland lakes are further divided into oxbow lakes (generally river connected, deep, and suitable for fish habitation, mud lakes (shallow and suitable only for fish rearing), and lakes created due to beaver activity.

Several watersheds are entirely within the refuge boundary. These watershed include the Hodzana and Hadweenzic watersheds in the northwest section of the refuge, the Chandalar Creek watershed in the northeast corner, and the Grass and Sucker river watersheds in the southcentral portion of the refuge. Having these watersheds entirely within the refuge and virtually in their natural condition provides the opportunity to study what are basically undisturbed watersheds. See Figure 8 for refuge watersheds.

Runoff and Flooding. Although data related to runoff are limited for the refuge, it is known that mean annual runoff throughout much of the upper Yukon-Porcupine region is very low, less than 0.5 cubic feet per second (cfs) per square mile in the lowland area. In the uplands and mountains north of the Flats runoff increases to nearly 2 cfs per square mile. Mean annual peak runoff is less than 10 cfs per square mile in the lowlands, over 25 cfs per square mile in the mountains. Average runoff over the upper Yukon-Porcupine region is about 0.5 cfs per square mile. This is equivalent to an average annual runoff of nine inches over the entire region.

Figure 8. Watersheds on the Yukon Flats Refuge.



Some of the most extensive floods in Alaska have occurred on the Yukon River system. Relatively short summers concentrate the major portion of the annual runoff into less than five months. High flows occur from May through September; low flows from October through April. Beginning in late September, freezing weather at the head of tributaries rapidly advances downstream. By April, flow is gradually reduced to only the infiltration of groundwater in the stream bed. In May, rapid snowmelt occurs, overflowing frozen or ice-jammed channels and often leading to spectacular spring break up floods. Most peak discharges in the region occur following break up. The maximum recorded flow on the Yukon River near the western boundary of the refuge is 670,000 cfs; average discharge at this point is 119,000 cfs (Lamke et al. 1982). Smaller peaks sometimes occur in late summer from heavy precipitation, particularly where permafrost is near the surface, preventing infiltration. The Yukon River is turbid and has a silty, sandy bottom.

The Yukon River is most susceptible to flooding because of ice jams during break up, usually in May or early June (average date of break up at Fort Yukon is May 15). Ice jams cause flooding upstream by restricting the flow of water, thus raising the water level immediately upstream. Downstream areas are often flooded when the ice jams break. Most of the communities along the Yukon are subject to this flooding. Fort Yukon, because of its location immediately upstream from the confluence of the Porcupine and Yukon rivers, is particularly vulnerable to annual flooding. The Yukon Flats area is susceptible to spring flooding. Such flooding results in the "recharge" of many of the lakes, sloughs, and marshes in the Yukon Flats, helping to maintain the area as high value habitat for waterfowl and other wildlife.

Water Quality. The chemical quality of surface water in the refuge and adjacent areas is good. Dissolved solids average less than 200 milligrams per liter (mg/l). All of the waters sampled are of the calcium bicarbonate type with no appreciable iron content. Streams in the refuge have an average sediment load of not more than 100 mg/l throughout most of the year. Streams in the Yukon Flats commonly carry less than 100 mg/l of sediment, while in the uplands and mountains surrounding the Flats sediment loads may be as high as 500 mg/l. Surface water temperatures noted in the area of the refuge range from 32 to 52 degrees Fahrenheit.

One notable exception to the generally favorable water quality on the refuge is Birch Creek. Mining in the headwaters of Birch Creek (off refuge) has resulted in significant deterioration of water quality which is still evident downstream on the refuge. Problems are associated with two major factors--excessive sediment load and toxic heavy metal precipitation on bedload sediment particles. The primary problem with Birch Creek on the refuge is turbidity which is affecting aquatic habitat and fisheries. Data from the Alaska Department of Natural Resources shows that in certain instances in 1985, turbidity levels at the village of Birch Creek exceeded the drinking water standard by 1,400 percent (letter from Mack, hydrologist for the Alaska Department of Natural Resources, to Barnett, attorney for plaintiffs, in Sierra Club et al. 1986). The water, which was formerly crystal clear, must be sanitized with clorox or boiling before drinking (declaration of Susan James, vice president of the Birch Creek Village Council, in Sierra Club et al. 1986). Though other water quality problems are not well documented this far downstream, there is concern over potential impacts to other wildlife species as well as to residents of Birch Creek who use the creek as a source of domestic water. A cooperative effort involving

the Service, the Environmental Protection Agency, the Bureau of Land Management, and the Alaska Department of Environmental Conservation needs to be undertaken to develop a plan to rectify the current water quality impacts on Birch Creek.

BIOLOGICAL ENVIRONMENT

VEGETATION AND LAND COVER TYPES

General Description of Vegetation. The Yukon Flats is within the northern boreal subzone of central Alaska. Vegetation patterns on the refuge are complex--primarily the result of fire history, sediment deposition during periodic flooding, a braided drainage system, and discontinuous permafrost.

The refuge is roughly divided into three physiographic zones. These are:

Riparian and Wetlands. Areas less than 600 feet in elevation or along major rivers. This zone includes 8,300 square miles (48 percent of refuge).

Uplands. Areas between 600-1,000 feet in elevation. This zone includes 5,000 square miles (29 percent of refuge).

Mountains. Areas of the refuge over 1,000 feet in elevation. This zone includes 4,000 square miles (23 percent of the refuge).

Forests predominate at lower elevations with timberline at 2,300 to 3,000 feet (700 to 900 m). Forest vegetation is dominated by several tree species that form five distinct forest communities based on tree species dominance. *Picea glauca* (white spruce) reaches its optimum growth adjacent to stream channels, but is also found on a diversity of sites up to treeline. *Picea mariana* (black spruce) typically grows in open stands and is common on sites with restricted drainage such as muskeg and north-facing slopes (usually with a shallow thaw zone). *Betula papyrifera* (white birch) is characteristically an upland species and often occurs mixed with white spruce. *Populus tremuloides* (quaking aspen) predominates on well to extremely well drained south-facing slopes, while *Populus balsamifera* (balsam poplar) is primarily a riparian species forming forest communities often associated with *Picea glauca*.

Shrub communities of *Alnus* (alder) and *Salix* (willow) are most abundant on riparian sites. Dwarf shrubs, *Betula glandulosa* (glandular birch), *Ledum decumbens* (needleleaf Labrador tea), *Empetrum nigrum* (crowberry), *Vaccinium uliginosum* (blueberry), and *Dryas octopetala* (mountain avens), are common above timberline.

Dwarf shrubs, such as Chamaedaphne calyculata (leatherleaf) and Andromeda polifolia (bog rosemary), are typical of poorly drained organic soil, while others like Rosa acicularis (prickly rose), Viburnum edule (highbush cranberry), and Shepherdia canadensis (soapberry) are characteristic of well drained mineral soils in forests.

Herbaceous plants, Eriophorum vaginatum (sheath cottongrass) and Carex bigelowii (Bigelow sedge), are most abundant in dwarf shrub-graminoid tussock tundra. Herbs also predominate as emergents on pond or lake margins--Carex aquatilis (water sedge) and Equisetum fluviatile (water horsetail)--and as aquatics such as Nuphar (pond lily) and Potamogeton (pondweed). Steep, treeless, south-facing hillsides often support Artemisia (sagebrush).

Land Cover Mapping. In 1982 the Fish and Wildlife Service entered into a cooperative agreement with the U.S. Geological Survey to survey and map land cover types of the Yukon Flats Refuge using satellite (Landsat) imagery. It was felt that high altitude satellite photo-imagery providing computerized digital data was the most efficient and least costly means of mapping vegetation on the refuge while meeting planning deadlines imposed by ANILCA.

The digital data provided by Landsat is based on spectral reflectance classes. Land cover is differentiated largely by the amount of water in the ground and the percentage of shrubs in the canopy cover.

Landsat provides a good "broad-brush" map of vegetation, is relatively fast to complete, and is easy to update. There are, however, some significant problems with Landsat mapping when used to interpret vegetation communities. These problems include:

Landsat is very sensitive to differences in canopy cover, but very insensitive to differences in vegetation height. As a result deciduous trees and shrubs are difficult to distinguish.

Landsat is not sensitive to differences in vegetation types unless the types have different soil and plant water or canopy characteristics. As a result, it is difficult to separate marshes from closed deciduous scrub communities or wetlands from damp upland forests. Additional data, such as elevation, may be used to distinguish these types.

Relative diversity of a cover type is difficult to identify with Landsat data. Landsat "sees" homogeneous classes.

Landsat data is recorded in a grid system. The data unit is a small rectangular area called a pixel. The size of the pixel may vary by refuge. On the Yukon Flats Refuge pixel size is slightly less than 5 acres. Because pixels are the smallest homogeneous identifiable unit of cover identified by Landsat and because they are more or less square, they are insensitive to long narrow bands of habitat. Emergent vegetation surrounding a lake is an example of a vegetation type lost by Landsat. Linear and small wetlands are also frequently not identified by Landsat.

As a result of these problems, the vegetation mapping for the refuge is generalized. A more refined habitat map recognizing smaller habitat units will be done later by traditional aerial photo interpretation. Until then the refuge has been mapped on a 1:250,000 scale using the Landsat multispectral high altitude imagery.

Field studies were conducted prior to classifying Landsat spectral data. Vegetation patterns on the ground were analyzed in a number of study blocks within the refuge. The data collected from these blocks was then used to define the spectral patterns as seen by Landsat. Thirteen land cover types were defined and used to describe the vegetation on the refuge. These types are described in Table 5. Acreage by cover type for all lands in the refuge, both federal and private, are shown in Table 4. Figures 9 through 12 graphically display the general location of the cover types on the refuge.

Table 4. Acreage summary of land cover classes on Yukon Flats Refuge.

Land Cover Class	Federal	Private*	Percentage Total Refuge
Closed needleleaf forest	985,100	274,100	11
Open needleleaf forest	2,969,100	842,100	34
Deciduous forest and scrub	1,133,500	765,300	17
Closed deciduous scrub	752,400	277,300	9
Mixed forest	1,576,500	398,900	18
Open deciduous scrub	119,500	12,400	1
Graminoid marsh	117,200	163,600	2
Alpine scrub	53,200	8,500	1
Prostrate dwarf shrub tundra	162,000	23,800	2
Alpine barren	54,100	10,900	0
Lowland alluvium and mud	13,300	12,200	0
Clear water	142,200	117,200	2
Sedimented water	66,500	112,100	2
TOTAL	8,144,600	3,018,400	

* Does not include acreage in scattered allotments.

Table 5. Description of cover types mapped on Yukon Flats Refuge.

Closed needleleaf forest--Found from lowland to uplands on moist to well-drained sites. This type covers approximately 11 percent of the refuge and is dominated by white spruce. Tree cover varies from 50 to 100 percent. Understory shrubs, including prickly rose, alder, grayleaf willow, and red-osier dogwood, are scattered to abundant.

Open needleleaf forest--Areas that are moderately to poorly drained with a 10 to 50 percent tree cover. Black spruce dominates this type which covers forty percent of the refuge. There is a well developed, tall deciduous shrub layer as well as dwarf shrubs and an herb layer. Common understory plants include prickly rose, willow, lingonberry, red bearberry, and dwarf scouring rush. Dwarf shrub graminoid (tussock peatland) is included within this land cover class because it is spectrally similar.

Deciduous forest and scrub--Areas include deciduous forest and scrub classes that cannot be spectrally separated. Dominant trees in the forest class are aspen, balsam poplar, and white birch. White spruce may be present. In scrub areas closely spaced deciduous shrubs range from one half to four meters tall. Willow and alder are the most common shrubs.

Closed deciduous scrub--Scrub areas that can be distinguished from forests are included in this class. Attributes of this cover type are described under deciduous forest and scrub. In addition, patterned fens (i.e., string bogs) and graminoid marshes are included in this land cover type.

Mixed forest--White spruce and paper birch are co-dominants. Willows, prickly rose, and linnea are common shrub understory plants in this type.

Open deciduous scrub--The dominant land cover in wetlands, shrubs are spaced so that most do not touch. Willows, dwarf birch, blueberries, red bearberry, and Labrador tea are the most common plants.

Graminoid marsh--Also included under closed deciduous scrub, this wetland cover type is dominated by grasslike plants which are periodically flooded.

Alpine scrub--Alpine mesic areas covered with deciduous shrubs including glandular birch, green alder, willow, and spirea.

Prostrate dwarf shrub tundra--Areas are covered with slow growing dwarf shrubs, chiefly heaths and crowberry. Mosses and lichens are abundant.

Alpine barren--Alpine areas where rocks and bare mineral soils dominate.

Lowland alluvium and mud--Frequently flooded areas that are sparsely vegetated. Colonizing species include balsam poplar, yellow dryas, and fireweed.

Clear water--Water, typically lakes, that are low in particulates.

Sedimented water--Water, such as the Yukon River, that is high is particulates.

Figure 9. Land cover classes - forests.

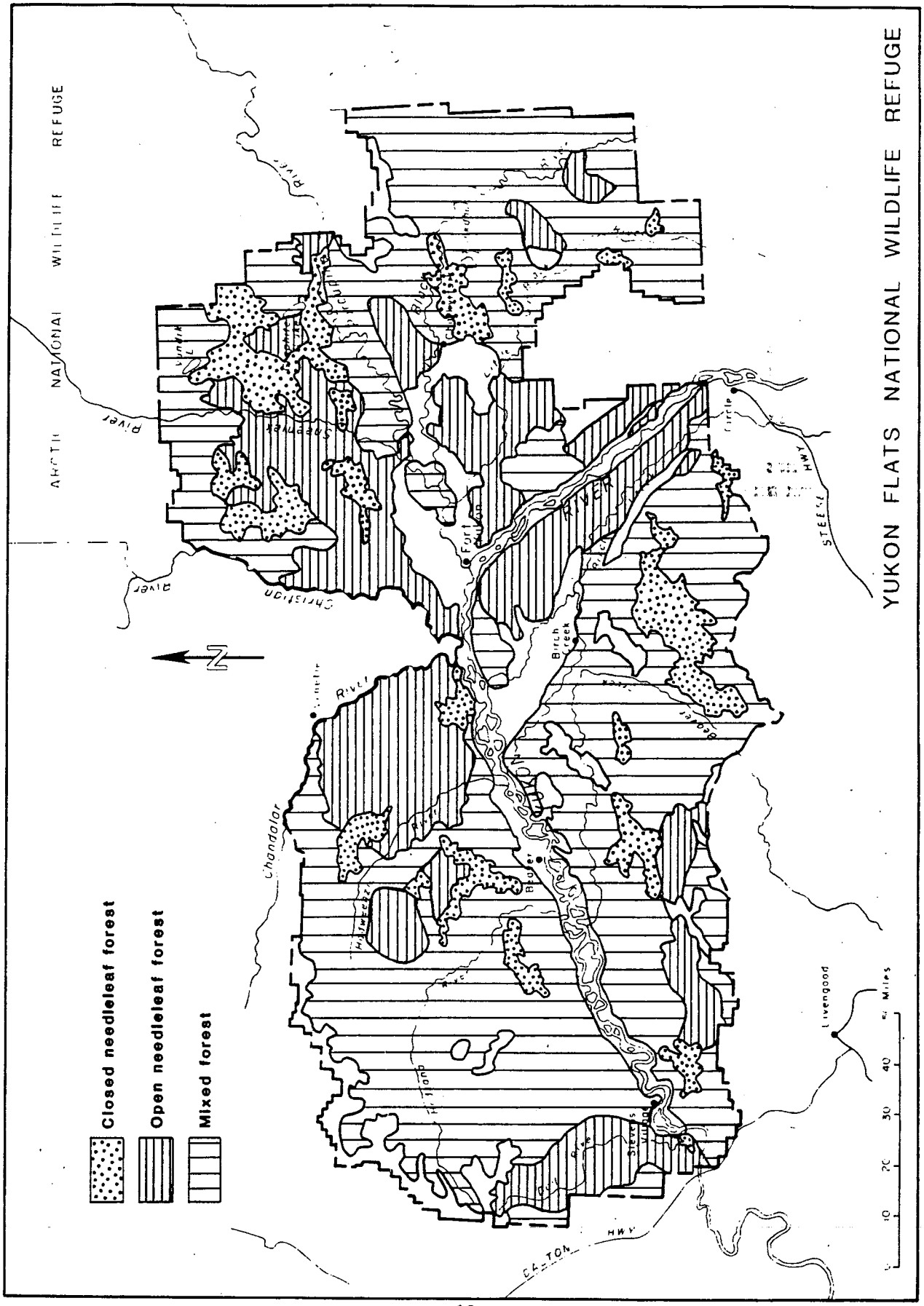


Figure 10. Land cover classes - scrub/forest.

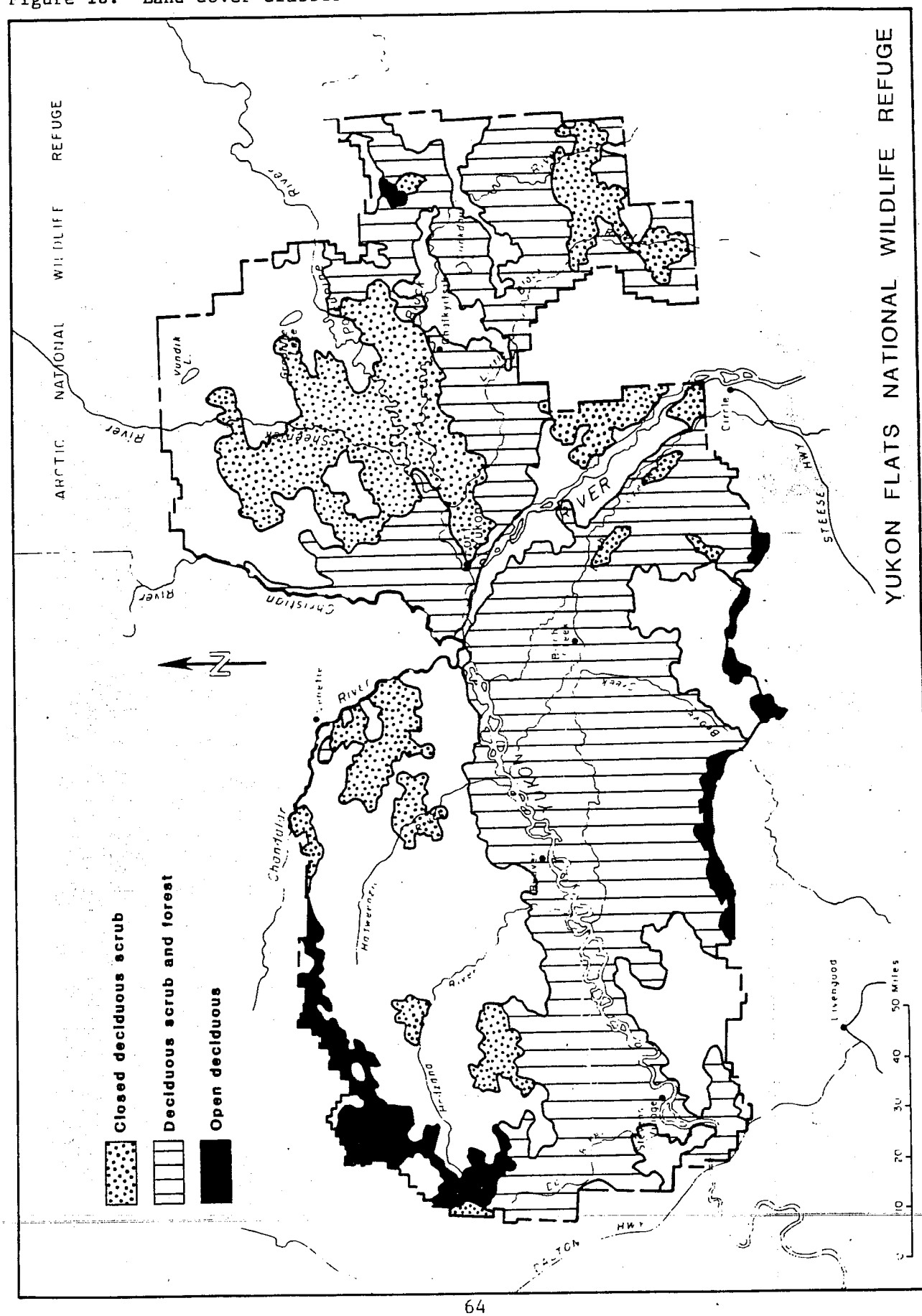


Figure 11. Land cover classes - scrub.

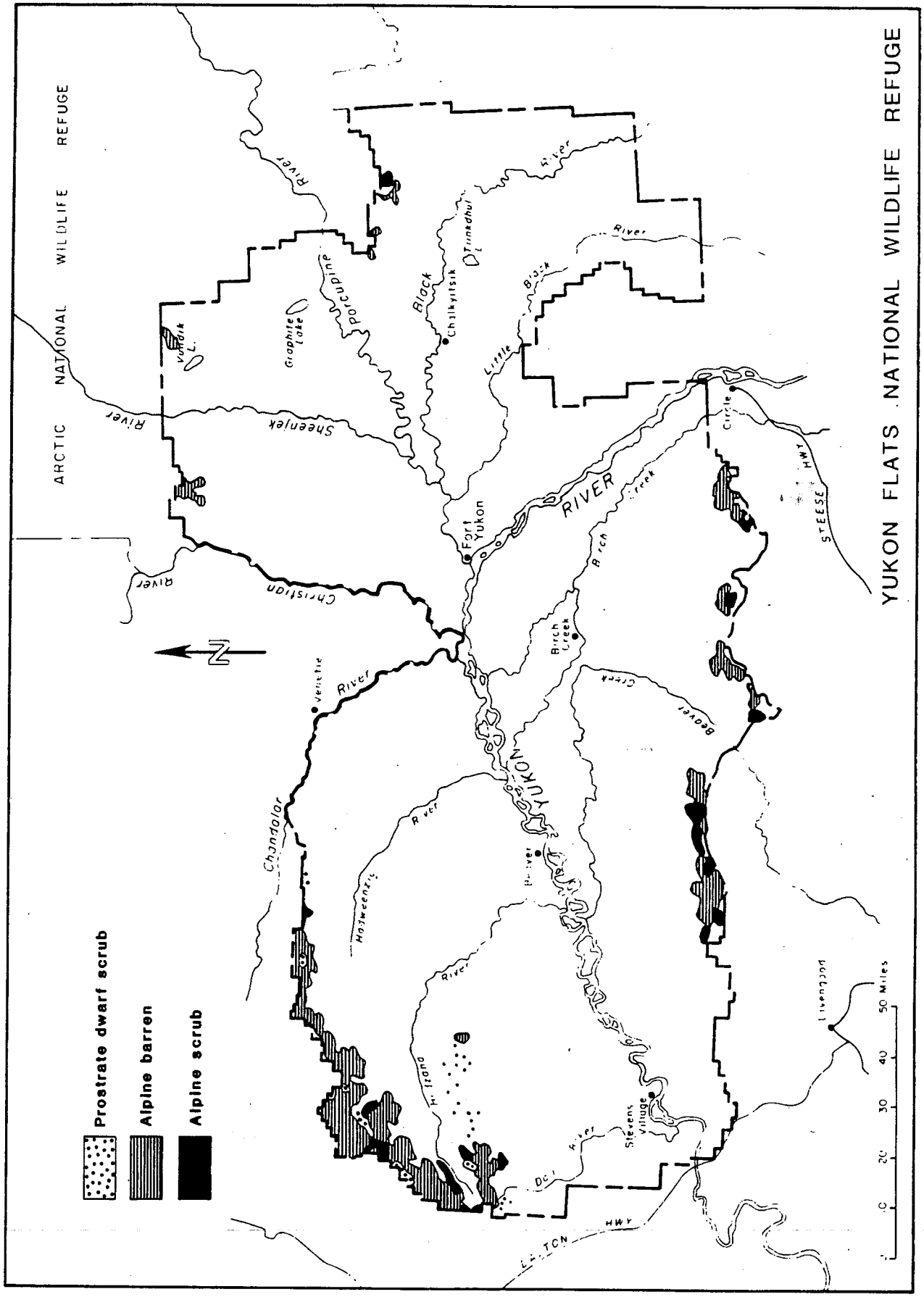
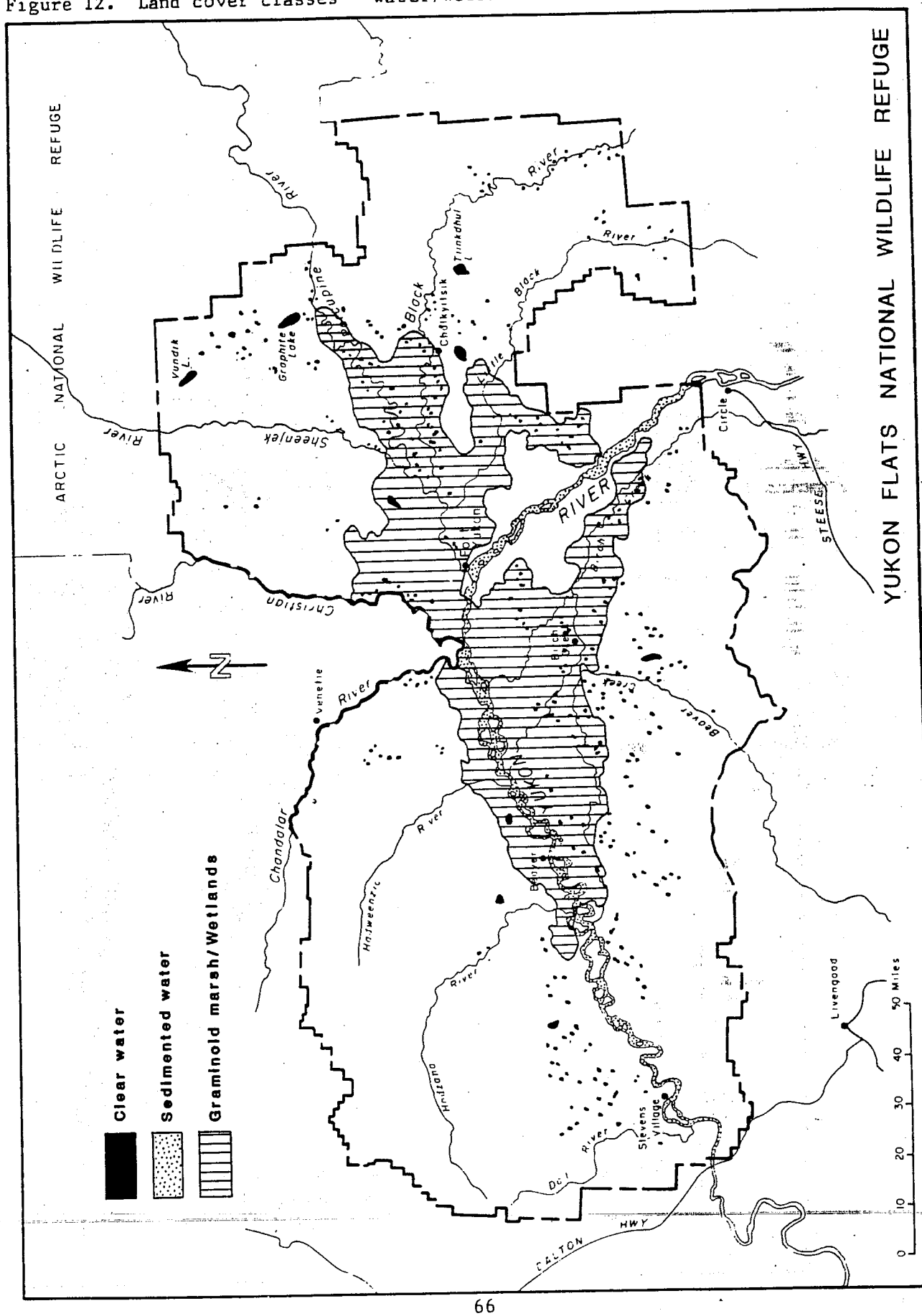


Figure 12. Land cover classes - water/wetlands.



WILDLIFE

There are at least 210 species of birds, mammals, and fish which use the Yukon Flats Refuge. Appendices D, E, and F contain species list of the birds, mammals, and fish found on the refuge. A total of 147 bird, 39 mammal, and 24 fish species occur or potentially occur on refuge lands.

Endangered Species. The American peregrine falcon is the only endangered species known to occur on the Yukon Flats Refuge. Surveys (concentrating on the major rivers) have identified nesting sites on the Porcupine River, middle Yukon River, and Black River (Ritchie 1984, Bente et al. 1983, Roseneau et al. 1980, Mindell and Craighead 1981) within the refuge boundary. All of these sites are associated with cliffs or bluffs near the respective rivers. Two active nests are known on refuge lands. More than two young per nesting pair per year have been produced from these sites (1982 and 1983). Based on intensive surveys of small rivers and isolated rock outcrops in other areas of the state, it is likely that 20 to 30 pairs of peregrines nest on the refuge. With peregrine populations in the state increasing, the number of nesting pairs in the refuge will also likely increase.

Prey remains were collected in the Porcupine and middle Yukon River areas. Shorebirds, passerine, and waterfowl were the principal prey species groups with lesser yellowlegs, common snipe, and gray jay being species most commonly represented in the collections (Bente et al. 1983, Ritchie 1983).

National Resource Species. The Service categorizes 13 wildlife species found on the Yukon Flats Refuge as National Resource Species (formerly called National Species of Special Emphasis). National Resource Species are an internal Service designation used to focus management direction on selected species. National Resource Species found on the Yukon Flats Refuge include:

Tundra swan	Northern pintail	Bald eagle
Trumpeter swan	Mallard	Golden eagle
Greater white-fronted goose	Canvasback	Peregrine falcon
	Ring-necked duck	Sandhill crane
Canada goose	Red head	

The Yukon Flats Refuge provides important nesting, breeding, or migrating habitat for all of the above listed species. In July of 1985, the Service issued the Regional Resource Plan Cycle 2. Included in this document are strategies for management of National Species of Special Emphasis (now called National Resource Species) found in Alaska.

Since our knowledge of wildlife populations and habitats in Alaska is limited, the preferred strategy for all National Resource Species includes assessing population and habitat parameters. Additional management strategies for the identified waterfowl species are: to evaluated subsistence harvest; to manage the hunted species for populations of a determined size allowing for recreational harvest; to preserve and protect wetlands habitats on the refuge system; and to participate in planning on non-refuge system lands to minimize the impacts of development.

Preferred strategies for raptors include participating in planning economic development on non-refuge lands to minimize impacts; monitoring contaminants affecting raptors, and coordinating with other countries to reduce pesticide use.

Waterfowl. The Yukon Flats is one of the most productive waterfowl breeding areas in North America. Although the reasons for the high productivity of the Flats are not fully understood, the area combines an extensive system of lakes, ponds, and sloughs with a relatively stable water regime and a high percent of fertile water bodies. Annual production varies depending largely on spring conditions, i.e., lateness and amount of flooding (Lensink 1965). In 1962, the breeding population of ducks on the Yukon Flats was estimated to be over one-half million, a number representing 1.6 percent of the continental waterfowl breeding population (USDI 1964). Many wetland areas of Canada and the continental United States have since been drained, reducing breeding habitat and increasing the significance of the Yukon Flats for waterfowl breeding. Today, a long-term average (1975-1984) of about 1.6 million ducks is estimated to breed on the Yukon Flats annually.

The significance of the Flats as a waterfowl production area has been recognized since the early 1960's, when the Rampart Canyon Dam was proposed for the Yukon River. Over 10,000 square miles of wetlands would have been inundated. The proposal was rejected when the extent of the impact on waterfowl and other wildlife was recognized. Birds banded on Yukon Flats have been recovered in all four North American flyways (Lensink 1962).

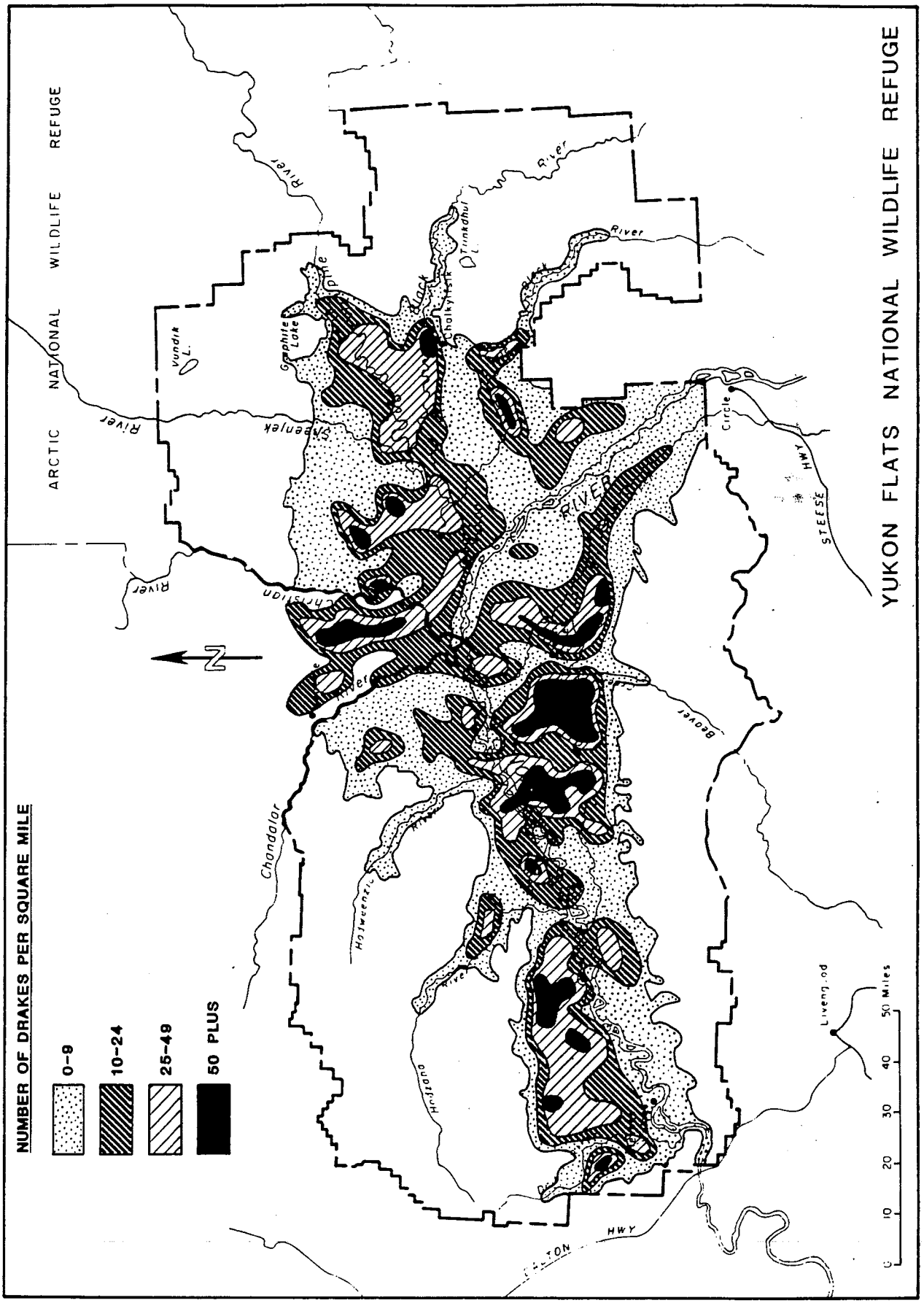
Waterfowl surveys have been conducted on the Yukon Flats since the early 1950's. Table 6 summarizes ten years (1975-1984) of waterfowl surveys. Figure 13 shows drake densities per square mile on the refuge as mapped by Lensink in the mid-sixties.

In addition to ducks, Canada and white-fronted geese commonly nest on the refuge. About 8,000 Canada geese and 2,000 white-fronted geese breed on the refuge. In addition thousands of snow geese migrate through the Yukon Flats to and from breeding grounds north of the refuge.

Table 6. Alaska waterfowl breeding population survey, Stratum 4, Yukon Flats Refuge. Source: U.S. Department of the Interior, Fish and Wildlife Service. 1975-1984. Waterfowl investigations. Juneau, Alaska.

Species	Average Breeding Population (1975-84)	Species	Average Breeding Population (1975-84)
Dabblers		Divers	
Mallard	82,800	Redhead	5,400
American wigeon	277,100	Canvasback	58,600
Green-winged teal	81,500	Scaup	476,400
Blue-winged teal	2,800	Ring-necked duck	1,300
Northern shoveler	91,500	Goldeneye	25,900
Pintail	350,300	Bufflehead	28,100
Gadwall	1,300	SUBTOTAL	595,700
SUBTOTAL	887,300		
Miscellaneous			
Oldsquaw	74,100		
Scoter	47,800		
Merganser	1,900	TOTAL ALL DUCK SPECIES = 1,606,800	
SUBTOTAL	123,800		

Figure 13. Drake densities per square mile on the refuge, mid-sixties. Source: Lensink 1965.



Trumpeter swans nest on the refuge. A complete census of these birds has not yet been done. Tundra swans may also be present, although siting are unconfirmed.

Despite being one of the best waterfowl production areas in North America, little is really known about the waterfowl habitat of the Yukon Flats. The Landsat survey is the first systematic inventory of lakes and ponds on the refuge. Table 7 summarizes the results of that high altitude inventory.

In addition, there are 231,900 acres (362 square miles) of water in streams and rivers. In the early 1960s, Lensink (1965) estimated that there were 36,000 lakes or roughly 1,181 square miles of water on the Yukon Flats. His estimates, based on smaller samples, are roughly twice that of the Landsat-based estimates. It has yet to be determined why there is such a significant discrepancy in the number of lakes between Landsat-based estimates and Lensink's estimates, whether it is due to sampling error, drying up of wetlands, pixel size, loss due to pixel shape, or some other factor.

Table 7. Numbers and acreage of lakes and ponds on the Yukon Flats Refuge (from U.S.G.S. Landsat imagery).

Size Class	No. of Lakes	Acreage
0-10	11,600	54,000
11-40	3,800	65,200
41-80	900	36,600
81-160	500	35,100
161-220	100	12,200
221-400	100	19,200
400 plus	80	31,500
TOTAL	17,080	253,800

Other Waterbirds. The refuge supports a significant sandhill crane breeding population. An estimated ten year average is 11,000 cranes.

Pacific, common, and red-throated loons nest on the refuge. The breeding population of Pacific loons is estimated at about 15,000 birds. Horned and red-necked grebes are also abundant during the spring and summer nesting season with the total grebe population estimated to be at least 100,000 birds, and may be significantly higher.

Raptors. A variety of raptors inhabit the refuge, though in low numbers. Cliff dwelling habitat on the refuge is limited to the Porcupine River in the Lower Rampart section, the Yukon River as it leaves the refuge, and limited areas on the Black and Hodzana rivers and along streams flowing from the White Mountains. In addition to peregrine falcon (discussed previously), these cliffs provide nesting habitat for golden eagles and red-tailed hawks. These species range throughout the refuge preying on waterfowl and small mammals.

The Yukon Flats also provide habitat for ground and tree-nesting raptors. Great horned, short-eared, great gray, hawk, and snowy owls; goshawks;

sharp-shinned, rough-legged, and Swainson's hawks; merlins; American kestrels; osprey; and Northern harriers are found on the refuge.

Moose. Moose are currently the dominant ungulate on the Yukon Flats Refuge. Historical records of moose activity in the area are unclear. Moose have ranged throughout the Yukon Flats for at least the last 100 years. The first settlers in interior Alaska observed moose south of the Yukon River (Gasaway, personal communication). Indians and trappers claimed that moose had only been found west of Fort Yukon since about 1850.

During the winter, moose in Alaska have been observed to depend heavily on willow as forage. Four species of willow are favored--*Salix interior*, *S. alaxensis*, *S. arbusculoides*, and *S. pulchra*. In addition balsam poplar, aspen, and red osier dogwood are preferred browse. Aquatic plants are key spring and summer food.

Preliminary results from an ongoing cooperative moose study (FWS and ADF&G) indicate that, at least for females, refuge moose can be divided into three segments. One group migrates from winter range along the rivers to summer habitat in the uplands. A second segment is more sedentary, spending the entire year in small, localized areas along the Yukon River. The third segment winters in the mountains and migrates onto the flats or lower foothills during the spring and summer, returning to the higher elevations in the fall (McLean and Nowlin 1984).

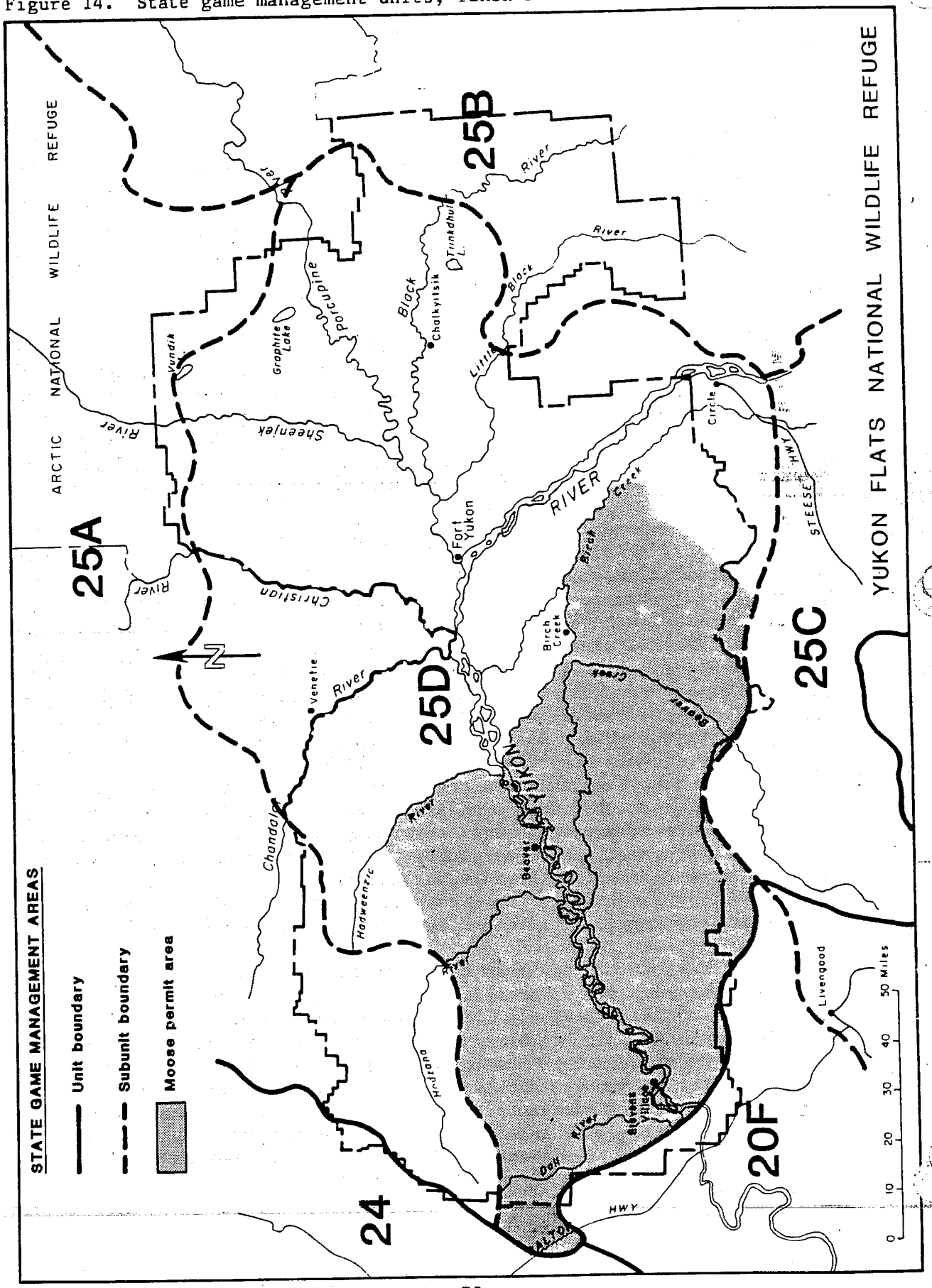
Game Management Subunit (GMS) 25D includes most of the Yukon Flats Refuge. See Figure 14. Currently the moose population in the refuge is extremely low, particularly in the western two-thirds (6,740 square miles) of GMS 25D. This area is presently managed as a special permit hunt because of the low populations. ADF&G and the Service are cooperating in a study of moose in this area. The preliminary moose density estimate for GMS 25D is 0.11 moose/sq. mile (Nowlin, personal communication). This density translates into an estimated population of about 800 moose in GMS 25D (USDI-FWS 1983), a number considerably lower than moose densities estimated in 1962. At that time estimates were 0.3, 0.8, and 1.8 moose/sq. mile in low, medium, and high density areas respectively (Leopold 1966).

The reason for the low moose population in the western part of the Flats is not fully understood. Hunting, predation, and less than favorable habitat conditions probably combine, resulting in the low moose population. The study currently in progress on the refuge is intended to define the nature of seasonal moose movements and habitat use.

The moose population in the eastern portion of the Flats is not as depressed. Habitat conditions are more favorable in the Black and Porcupine drainages.

Residents of the Yukon Flats depend on moose as a primary source of meat. Local residents are responsible for the majority of the moose harvest in the refuge. The current low moose population, the lack of roads, and the long distance from any major population center discourage recreational hunting. The special permit hunt area in the western section of the refuge makes that area essentially a subsistence moose hunt area. Approximately 23 to 33 moose are harvested annually in the special permit hunt area, a number significantly below the estimated 110 animals needed to satisfy even local needs (Nowlin 1984b). However, a harvest greater than 35 animals cannot be sustained by the present moose population (Nowlin 1984b).

Figure 14. State game management units, Yukon Flats area. Source: ADF&G.



Dall Sheep. Dall sheep are found in the White Mountains on the southern boundary of the refuge. Most available sheep habitat is in the White Mountains National Recreation Area and the Steese National Conservation Area which are managed by the BLM. However, sheep are found on the northern side of Mt. Schwatka which lies on the southern boundary of the refuge. In addition, there is a heavily used mineral lick in the Jefferson Creek drainage on the refuge. Dall sheep range includes approximately 53,000 acres of refuge lands on the northern slopes of the White Mountains. See Figure 15 for current Dall sheep distribution on the refuge.

Surveys and studies made by Jack Gross in 1957 and ADF&G (alone or in conjunction with USFWS or BLM) in the early 1960's, 1970's, and early 1980's indicate that the population declined about 56% from pre-1970 to 1977 (Gross 1963, Jones 1960-62, Smith 1977). Since 1977 the population has risen slightly. A movement and distribution study being conducted by BLM and ADF&G shows movement among adjacent mountains. Three ewes collared on Victoria Mountain have since been located on Mt. Schwatka (Durtsche 1983a).

Escape habitat is limited in the White Mountains (Durtsche 1983a). This lack of habitat may account for the relatively low population of Dall sheep found here. Hunting pressure is not a factor on the sheep population because of generally poor access into the area.

Table 8 shows population and composition data from the ADF&G surveys. Mt. Schwatka data is separated from the total White Mountain population data to indicate the importance of Refuge habitat for Dall sheep.

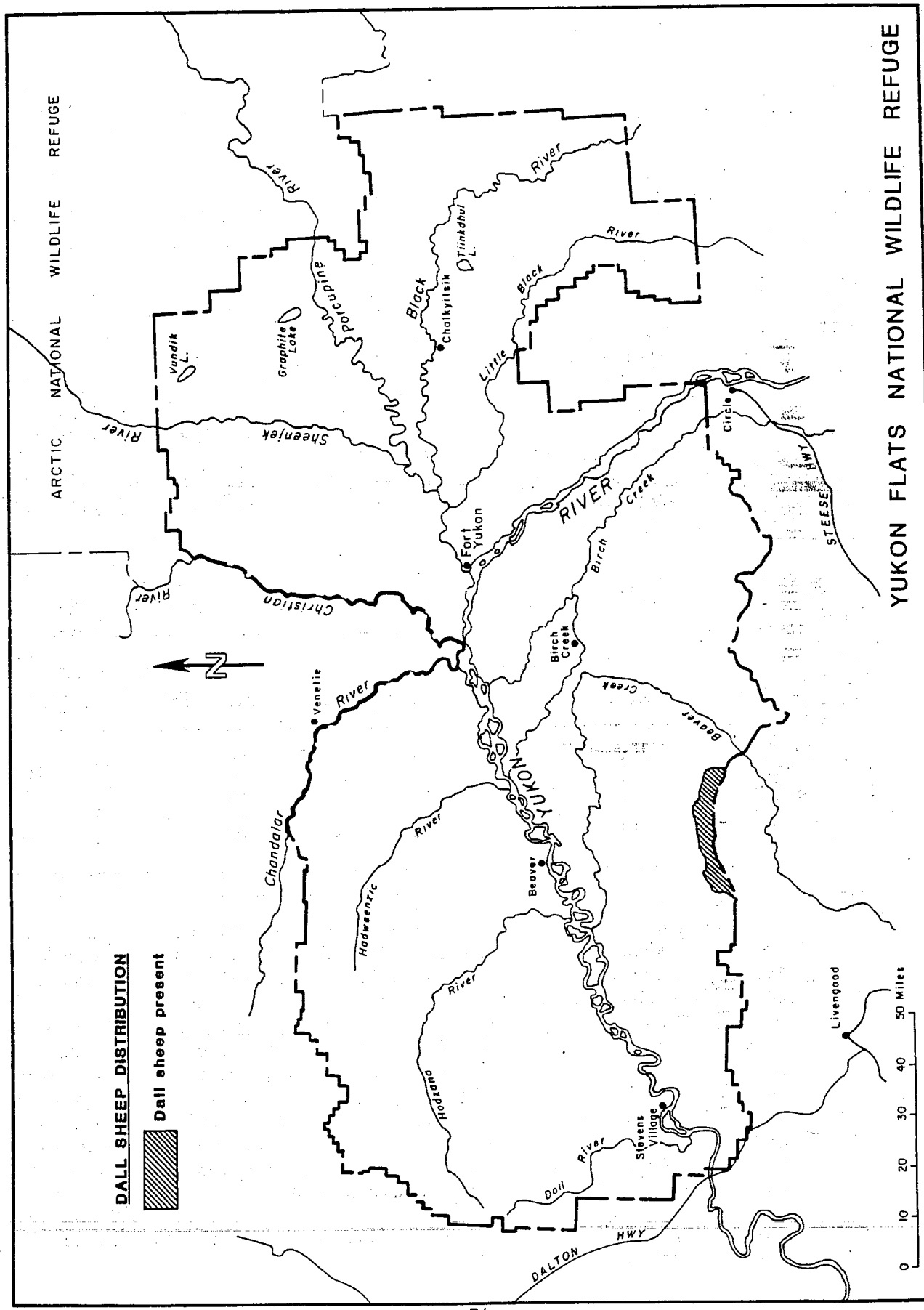
Table 8. Dall sheep population and composition data.

	Mt. Schwatka Sheep					Other White Mountain Sheep				
Year	Rams	Ewes	Yrls.	Lambs	Total	Rams	Ewes	Yrls.	Lambs	Total
1970	18	55	--	28	101	29	116	--	42	187
1977	14	31	--	11	56	21	25	--	9	65
May 1982	7	23	9	--	39	13	39	6	8	66
July 1982	18	52	1	3	74	25	22	2	10	59

Caribou. The Yukon Flats Refuge contains seasonal or year-round habitat for three Alaskan caribou herds. The largest herd using the refuge is the Porcupine herd. This herd summers in the coastal plain and foothills of Alaska and the Yukon Territory along the Beaufort Sea north of the Brooks Range. This herd migrates in the fall along three main routes to three primary winter ranges. Two of the three routes and winter ranges are primarily in Canada. The third, the Chandalar route, runs westward along the southern foothills of the Brooks range into the Coleen, Sheenjek, and Chandalar drainages (Whitten and Cameron 1982). Animals using this route generally winter in Alaska between the Brooks Range and the Yukon River and from the Chandalar River eastward. The northeastern portion of the refuge is encompassed in this large winter range area.

Occasionally animals follow the Old Crow route in the Yukon Territory to the Porcupine River and then turn westward to follow the Chandalar route (Whitten and Cameron 1982).

Figure 15. Dall sheep distribution on the Yukon Flats Refuge.
Source: ADF&G 1973.



Despite considerable effort, caribou movements are still not well understood. Migration corridors and wintering areas are generally defined, however, specific drainages within general migration corridors or wintering areas may not be used for many years. The portion of the Porcupine herd using any one route or wintering area varies annually. In addition, small segments of the herd may winter in other areas, such as the Mackenzie River Delta, along the Arctic coast, or along the northern slopes of the Brooks Range.

The Forty Mile herd centered in the Tanana Hills, has traditionally included the White Mountains as part of their range. Although most of the White Mountains are administered by the BLM, the northern edge of the range forms the southern boundary of the refuge. Prior to the 1930's the Forty Mile herd made large scale movements (Davis et al. 1978) and migrated north of the Yukon on occasion. The White Mountains were used as one of three major wintering areas and the major calving area by the Forty Mile herd prior to the decline of the herd's population in the late thirties. Since that time use of the White Mountains has declined. The herd's range has shrunk commensurate with the decline in animal numbers, leaving the chief wintering area south of the White Mountains (Davis et al. 1978). In addition, the herd switched its primary calving area from the White Mountains to the Tanana Hills in 1963.

Caribou still winter and calve in the White Mountains (Durtsche 1983b), but not in the numbers of earlier times. A small group of non-migratory animals may be present in the White Mountains. See Figure 16 for caribou use areas on the refuge.

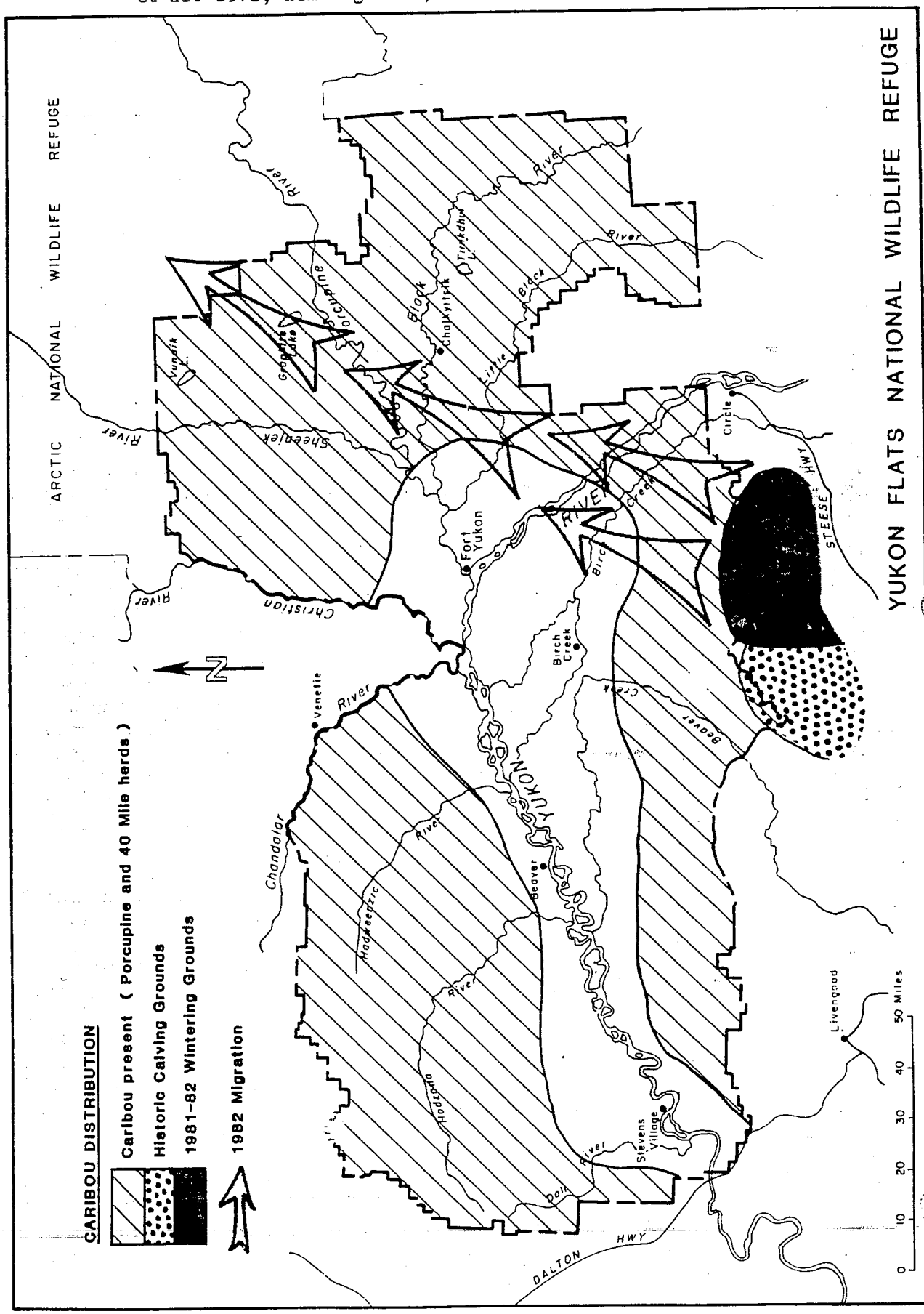
Wolves. Wolves range throughout the Yukon Flats. Although wolves prey on a variety of species, they are primarily dependent on large ungulates. Their numbers tend to respond to population fluctuations of the large ungulates on which they prey. Thus the low moose population on the Flats supports a low wolf population. Surveys in the western portion of GMS 25D indicate a wolf population of approximately 45 animals. This number, though low, represents a ratio of one wolf per eighteen moose (Nowlin 1984a). This ratio is significant because it is thought that when there is more than one wolf per twenty moose that wolves can control the moose population. The extent to which the wolf population controls moose numbers on the Yukon Flats Refuge is not known. The ADF&G is currently surveying wolf numbers in conjunction with the cooperative study on moose in GMS 25D.

Bears (Grizzly and Black). Both grizzly and black bear inhabit the refuge. The Yukon River valley is the northern limit of black bear range. Primarily a forest-dwelling species, they are most common in the forested river bottoms and lowlands. In the refuge, black bears are heavily dependent on blueberries as a source of food. Salmon are also part of the diet of the black bear on the refuge. Few other traditional black bear foods are found in the refuge to support the population in years of poor blueberry harvest (Hatler 1972). Black bear predation may be a significant cause of moose calf mortality.

Grizzly bears range throughout the refuge, but are most common in the upland and mountainous zones. Largely an open country animal, their preferred habitat is alpine and subalpine scrub and riparian zones.

Marten. Marten, along with lynx, are the most economically important furbearer on the refuge. Marten are usually associated with mature coniferous forests where they feed on tree squirrels. In Alaska, however, brush fields and burned areas are important marten habitat because of the high rodent populations.

Figure 16. Caribou use areas, Yukon Flats Refuge. Sources: ADF&G 1973, Davis et al. 1978, Hemming 1971, Whitten and Cameron 1982, USDI-FWS 1982a.



Lynx-Snowshoe Hare. Lynx are abundant on some areas of the Yukon Flats. The Black River drainage is probably the most consistently productive lynx producing area in Alaska. The lynx population rises and falls in synchrony with, but slightly behind, the snowshoe hare cycle. The cycle is about ten years long and has been intensively studied by biologists for years but is still not fully understood.

Beaver. The Yukon Flats provides good beaver habitat. The refuge has conducted a beaver food cache survey on sample areas of the refuge. The survey is intended to identify trends in beaver populations. Within the study area a food cache-activity/lodge ratio of 58 to 100 and a lodge/lake-pond ratio of 17 to 100 were observed. Food cache-activity/lodge ratio describes the number of beaver food caches per beaver lodge. It is used in conjunction with data on colony size related to number of food caches to estimate beaver populations. Since the relationship between colony size and cache number is still unknown, it is not possible to provide reliable estimates of the beaver population on the Flats. This information will be obtainable in the future.

Other Furbearers. Muskrat are abundant in the refuge wetlands and waterbodies. They have been, and continue to be, extensively trapped on the refuge. Red fox and wolverines are found in low numbers throughout the refuge.

Other Bird and Mammal Species. Many other species of birds and mammals use the refuge. A complete list of these species and the habitats they utilize are found in Appendices D and E.

FISH

The Yukon River fisheries are a complex resource that is only now beginning to be understood. The Yukon River (and 12 major tributaries) flow through the refuge. In addition, there are thousands of lakes on the refuge. Appendix F contains a list of fish species found on the refuge.

Residents of villages lying within the refuge boundary depend heavily on fish for subsistence. Table 9 provides information on subsistence fishing by resident of the villages on the Yukon Flats. Chinook and chum salmon are

Table 9. Yukon River subsistence salmon catch, Yukon Flats villages. Source: ADF&G 1984c, ADF&G 1985.

Village	No. of Families	Chinook	Summer Chum	Fall Chum	Coho	Total Salmon	Whitefish/ Sheefish
Stevens Village[1]	25	2763	3046	11679	182	17670	629/154
Beaver[2]	6	506	263	1761	1	2531	307/43
Fort Yukon[1]	25	2900	4410	12719	3	20032	2430/490
Circle[1]	10	2259	930	4096	0	7285	50/38
Venetie[3]	4	52	0	4345	0	4396	221/3

[1] 1985 catch.
[2] Village not surveyed in 1985. Data are averages from 1980 to 1984.
[3] Village not surveyed in 1985. Data are averages from 1979 to 1983.

particularly important food sources for local residents, providing a source of protein for themselves and their dogs. However, upper Yukon River residents consider moose the most important food source even though the volume of fish may exceed that of moose (Caulfield 1983, Nelson 1973). Bear and various raptor species on the refuge also utilize salmon as a portion of their diet.

Salmon that migrate through or spawn on the refuge travel more than 800 miles from the mouth of the Yukon to reach the refuge. Streams important for salmon spawning and migration on the refuge include the Yukon River and its major tributaries - the Hodzana, Hadweenzic, Chandalar, and Porcupine rivers and Beaver and Birch creeks - and the Sheenjek and Black rivers, tributaries of the Porcupine River. Escapement of salmon species bound for the upper Yukon River drainage spawning areas are directly related to the intensity of commercial and subsistence fishing which occurs downstream of the refuge, as well as harvest within the boundaries of the refuge. Data from escapement surveys completed on the Yukon Flats Refuge is shown in Table 10.

A limited amount of commercial salmon fishing occurs within the boundary of the refuge, primarily on Native selected and conveyed lands and Native allotments. Additional information on current and planned studies, subsistence use, and commercial fishing activities in the vicinity of the refuge are found in Appendix F.

National Resource Species. Two fish species which utilize the refuge have been identified by the Service as National Resource Species (formerly called National Species of Special Emphasis). These species are the chinook salmon and the coho salmon.

Chinook (King) Salmon. The Yukon River chinook salmon run, thought to number 200,000 to 500,000 fish, is one of the largest natural runs of any river system in the world. Adult chinook salmon enter the refuge in late June on their way to spawning streams, both within the refuge and farther up the Yukon River. Spawners bound for headwater areas in Canada are known to travel more than 2,000 miles in a 60-day period.

Chinook salmon mature in their second to seventh year. Spawning generally takes place in main channels of larger streams during late summer. Fry emerge from the gravel spawning areas in early spring. Many refuge streams are important feeding areas and migration routes as the juveniles remain in freshwater for up to two years before traveling to the sea. Additional studies are needed to accurately document the timing, distribution, and abundance of spawning by chinook salmon on the refuge.

Coho (Silver) Salmon. Coho salmon enter the Yukon Flats fishery the first part of September on their way to upriver spawning grounds. Fry emerge the following spring and take up residence in smaller streams where they remain for two years (sometimes only one) before the coho smolts migrate to the sea. The refuge has many rivers and streams that are important coho salmon migration routes. Additional studies are needed to accurately document the timing, distribution, and abundance of spawning by coho salmon on the refuge.

Chum Salmon. The Yukon River chum salmon population numbers from two to seven million fish, one of the largest populations of any river system in North America. Two chum salmon runs are evident on the Yukon Flats Refuge--a summer run and a fall run. Several drainages in the Yukon Flats Refuge are important spawning, migration, and rearing streams. They include, but are not limited

Table 10. Escapement surveys completed on the Yukon Flats Refuge. Source: Barton 1984.

Stream	Drainage	Year	King	Chum	Coho	Stream Mouth Latitude	Stream Mouth Longitude
Chandalar	Yukon	1960	-	-	-	66-36-35N	146-00-20W
		1973	-	-	-		
		1974	-	17,455	-		
		1975	-	6,345	-		
		1976	-	58	-		
		1977	-	4,183	-		
		1980	-	3,366	-		
		1981	-	4,906	-		
Sheenjek	Porcupine, Yukon	1960	-	-	-	66-44-30N	144-34-30W
		1973	-	1,288	-		
		1974	-	40,507	14		
		1975	-	78,060	6		
		1976	-	11,866	-		
		1977	-	20,506	-		
		1978	-	14,610	-		
		1979	-	41,140	-		
		1980	-	13,027	-		
		1981	-	69,043*	-		
		1982	-	29,093*	-		
		1983	-	45,733*	-		
Salmon Fork	Black, Porcupine, Yukon	1974	-	1,222	-	66-33-00N	142-32-00W
		1975	-	2,099	-		
		1976	-	-	-		
		1977	-	200	-		
		1980	-	31	-		
Black	Porcupine, Yukon	1960	-	-	-	66-41-30N	144-42-00W
		1973	-	-	-		
		1975	-	50	-		
		1976	-	-	-		
Hodzana	Yukon	1960	-	-	-	66-17-30N	147-46-30W
		1976	-	-	-		
		1983	-	31	-		
Birch	Yukon	1960	-	-	-		
		1971	-	-	-		
		1977	-	-	-		
Hadweenzic	Yukon	1976	-	-	-	66-27-00N	146-51-00W
Dall	Yukon	1973	-	-	-	66-00-30N	149-15-30W
Beaver	Beaver Creek Slough, Yukon	1954	-	-	-	66-14-00N	147-32-00W
		1960	-	-	-		
		1975	-	-	-		
		1976	-	-	-		
		1982	-	-	-		

* Side-scan sonar count

to, the Chandalar, Sheenjek, Hodzana, Black, and Porcupine rivers and Beaver Creek. The Sheenjek River and the Fishing Branch River (headwaters of the Porcupine River) are two of the most important fall chum salmon producing streams in the entire Yukon River drainage. Yukon River chum salmon migrate as young-of-the-year fry to the Bearing Sea soon after emergence in the spring (following breakup). Adults attain sexual maturity and return to the Yukon River for spawning in their third to sixth year of life. Available evidence indicates that age four is the predominant age of return for the Yukon River summer and fall chum salmon (Buklis and Barton 1984.)

Dolly Varden. Dolly Varden are primarily associated with the upper reaches of clearwater streams that have perennial ground water sources. Dolly Varden found within the refuge appear to be from resident populations and no cases of anadromy have been documented. Spawning activity begins in September and continues into October. Fry emerge in May. Resident populations are smaller in body size than anadromous populations. One population of Dolly Varden which has been identified on the refuge is in the Hodzana River above Caribou Bar.

Arctic Grayling. Arctic grayling are found in most clear, cold water streams and tributaries on the refuge. Spawning takes place during the months of May and June. Migration from the mainstem areas of large rivers to smaller headwater streams begins shortly after "ice out." Fry emerge in 11 to 23 days depending on water temperature. Grayling fry are small, very fragile, and subject to catastrophic losses during spring flooding.

Broad Whitefish. Broad whitefish are common on larger river/lake/slough systems and prefer areas of slower moving water. They are also found in landlocked lakes. Spawning activity of all whitefish is similar. They begin lengthy migration runs to spawning areas in mid-September. Spawning is usually complete by mid-October. Most broad whitefish are mature by age six or seven.

Sheefish. There are five major sheefish populations identified in Alaska. Sheefish on the refuge belong to the Upper Yukon River population. This group is most abundant in the turbid waters of the major rivers in the refuge and in the associated lake areas. Thought they remain primarily in the mainstem river, they are occasionally present feeding in lower reaches of tributary streams. Spawning is associated with relatively short migration runs and occurs from September to mid-October followed by a rapid migration to wintering areas. Males mature at the age of five to seven and females from seven to nine. Sheefish are alternate year spawners and are distinguished from other whitefish by the large mouth and large body size of up to 50 pounds, though the sheefish on the refuge seldom attain this size.

Bering Cisco. Bering cisco are present at the mouths of middle Yukon River tributaries early in the summer (Nowitna River, June 7; Porcupine River, June 17). Feeding will continue in these areas until mid-September when the cisco will move to spawning areas upriver. Bering cisco are little utilized except the small numbers taken for subsistence use by fishwheel and gillnet.

Round Whitefish. Round whitefish are found in refuge clearwater streams with gravel bottoms. They seem to prefer the swifter headwater areas although they are also found in the larger rivers and lakes. The round whitefish spawning period is from mid-September to mid-October.

Humpback Whitefish. Most common on the larger river systems of the refuge, humpback whitefish prefer the slower moving waters in the river/lake/slough systems. They are also found in landlocked lakes. Sexually mature (age five to seven) whitefish migrate to spawning areas during mid-September to mid-October. The humpback whitefish is often confused with the broad whitefish. All of the whitefish are important subsistence fish.

Least Cisco. Least cisco are abundant on the Yukon Flats Refuge in lakes and slow moving streams. Spawning runs begin during mid-September to spawning areas in the upper reaches of clearwater streams. Eggs winter in the gravel and hatch in early spring. The least cisco is an important subsistence fish and also an important food fish for eagles, hawks, and predatory fish.

Burbot. Found in rivers and lakes on the refuge, burbot are especially abundant in deepwater lakes and slow moving turbid water areas, though they use clear water areas for spawning activity. Spawning migrations of up to 50 miles have been recorded (Sterns, personal communication). Spawning begins in January or February. Age at maturity is four to seven years. Evidence exists that suggest burbot are alternate year spawners. They are an important subsistence fish.

Northern Pike. Northern pike are found in most rivers and in lakes that are deep enough and have an adequate oxygen supply to "overwinter" fish populations. The availability factor makes the northern pike an important subsistence fish. Spawning takes place in weedy areas in lakes, sloughs, and flood areas in river systems as soon as the ice breaks up. Spawning is usually associated with lengthy spawning runs. Northern pike mature in three or four years in Alaska (Cheney 1976 as sited in Morrow 1980). Sport fishing using charter planes out of Circle or Fairbanks is becoming more popular in the upper Yukon area. Whitefish provide an important food item for northern pike, but the mature northern pike forage items include anything from small insects to small mammals.

Other Fish Species. Alaska blackfish, longnose sucker, lake chub, and slimy sculpin are also found on the refuge and are important as prey species to other fish, birds, and mammals. Occasionally, these species are used for subsistence, dog food, or trapline bait.

HUMAN ENVIRONMENT

HISTORY

Prehistory. Interior Alaska's prehistory is still imperfectly known though recent discoveries have indicated potential existing in the area for discovery of the earliest sites in North America. The interior of the state remained essentially ice free during the last glaciations, when the area was the logical route for entry of immigrants into the New World from northeast Asia. Dated materials from the Old Crow Flats in the Yukon Territory, less than 100 miles northeast of the refuge, suggest that man was present in the area at least 27,000 years ago.

Earliest known sites in Alaska, such as the village site at Healy Lake some 100 miles south of the refuge, date from just over 11,000 years ago. Sites of this age are relatively widespread in Alaska and constitute the American Paleo-arctic tradition. This tradition is characterized by microblades (small, parallel-sided stone flakes) made from wedge-shaped cores; various bifacially flaked projectile points and knives; burins (tools used for working bone and antlers); and large core tools.

No known sites of the American Paleo-arctic tradition appear to be more recent than 8,000 years old. This leaves an unfilled gap in the sequence before the appearance of the forest-adapted Northern Archaic tradition about 6,000 years ago. This tradition is known from sites on and adjacent to the refuge, at Chalkyitsik and at 12 Mile Bluff near Circle. This tradition is characterized by side-notched projectile points and large irregular, oval or crescentic bifaced tools. Some sites also include microblades, though these were made from a different core type than were the earlier examples. The Northern Archaic tradition is evident until about 4,000 years ago.

After this time, the forest adaptation continued in the interior with developments that foreshadow the Athapaskan cultures of the recent past. This was first indicated by the Denali complex, which included microblades from a third core type. This tradition continued into the first millennium A.D., and, in its later manifestations, is associated with the Kavik-type projectile point, generally regarded as diagnostic of northern Athapaskan occupation. Sites with Kavik points first occur about 1,400 years ago and continue into recent centuries.

European Contact. Native populations of the region at the time of European contact were members of the Han, Tanana, and Kutchin (predominantly) groups of the Northern Athapaskan peoples. They were essentially nomadic hunters, dependent on summer fish resources and big game, primarily moose and caribou.

The first white man to reach the Yukon Flats was John Bell of the Hudson's Bay Company, traveling from the McKenzie River in 1845. The first European settlement in the area was the Hudson's Bay Company trading post at Fort Yukon (at the confluence of the Porcupine and Yukon rivers) established in 1847 by Alexander Hunter Murray. The fur trade quickly became the dominant element in the region's economy and established what is considered today as a traditional vocation for Natives on the Yukon Flats. The traders were followed into the region by the first missionaries who arrived in the early 1860's.

After Alaska was purchased by the United States from Russia in 1867, the Hudson's Bay Company was forced to vacate its holdings. Captain Charles P. Raymond, U.S. Army Surveyor, determined in 1869 that Fort Yukon was within the United States Territory. The Hudson's Bay Company post was subsequently moved back to Canadian soil at Old Ramparts on the Porcupine River. The Alaska Commercial Company assumed operations at Fort Yukon after the Hudson's Bay Company departed.

The first gold prospectors to enter the region came in 1873. This greater interest in the area led to more government attention. In 1883, Lt. Frederick Schwatka floated the Yukon River from Canada downstream to the Bering Sea, making accurate maps and descriptions of the area. The big gold years in the region began in the late 1880's. Major interest came with the discovery of gold on Birch Creek in 1893. This discovery resulted in the birth of Circle City, a community which grew to over 1,000 people during the gold "boom." Mining developments in the region were never as large as elsewhere in Alaska and the Yukon Territory. Interest in the area began to wane with the Klondike strike and major activity ceased shortly after the turn of the century.

In the 1920's, with fur at its zenith, Fort Yukon was the most important fur center in Alaska, the depression of the 1930's followed by World War II ended the heyday for fur on the Yukon Flats, though it still is an important activity for many local residents.

Archeological Sites. There are thirty-five sites in the area listed on the Alaska Heritage Resource Survey, many from the historic period. Surveys along the Porcupine River have located a substantial number of prehistoric sites. Surveys immediately west of the refuge along the trans-Alaska Pipeline corridor have been similarly productive. Work in progress can be expected to add more sites to the catalog.

It is probable that several hundred archeological sites potentially eligible for listing on the National Register of Historic Places remain to be discovered in the area. Such sites are expected to be more prevalent along stream sources (especially on stable banks and bluffs and at the confluence of tributary streams) and at lake inlets and outlets, although the presence of such sites virtually anywhere on the refuge cannot be ruled out.

POPULATION AND SETTLEMENT PATTERNS

Residents of seven communities within or adjacent to the Yukon Flats Refuge regularly take fish, wildlife, and plant materials from the refuge. These communities are Beaver, Birch Creek, Chalkyitsik, Circle, Fort Yukon, Stevens Village, and Venetie. Except for Fort Yukon, these are small bush communities typical of rural interior Alaska.

Population Trends. In the 1980 census, the seven local communities using the refuge had a population of 1,126 - about 0.3 percent of Alaska's total population of 401,851. In 1984, the State projected the population for these communities at 1,183 (Alaska Department of Labor 1985). The population of these communities are listed in Table 11.

Between 1960 and 1970, a 14 percent decline in the regional population occurred. Most of this loss occurred in Fort Yukon, the region's largest community. The large population loss in Fort Yukon masked the growth (25 percent) which occurred in the smaller communities during the same period. Several factors may have influenced population shifts which occurred during the period. The 1968 discovery of oil at Prudhoe Bay and the subsequence prospect of wage employment in Fairbanks and Anchorage may have drawn some residents from the Yukon Flats area. The possibility also exists that residents of Fort Yukon may have returned to more traditional lifestyles by relocating in the smaller communities. Some of this resettlement may have been in response to the imminent settlement of the aboriginal land claims of the Alaska Natives. Caulfield (1983) suggests that improved census data collection and consolidation of smaller outlying camps into larger communities are other possible contributing factors.

During the period from 1970 to 1980, the overall population of the Yukon Flats area grew by 18 percent. Three communities, Beaver, Birch Creek, and Chalkyitsik, experienced a decline in population. Again the large population shift in Fort Yukon (a 38 percent increase) significantly influenced the areal population picture. The six smaller communities experienced a slight decline (one percent) in population over this decade.

For most Athapaskan bush communities the concept of resident population is difficult to apply. It is necessary to understand the desire of people to

Table 11. Population trends of communities near Yukon Flats Refuge, 1960-1980. Source: U.S. Bureau of the Census; Tanana Chiefs Planning and Information Office 1983; Alaska Department of Labor, 1985.

Community	Population 1960	1970	1980	1984	Percent Change 1960-70	Percent Change 1970-80	Native Population 1980	Percent Total
Beaver	101	101	66	65	0	- 35	65	98
Birch Creek	32	40*	32	31	+ 25	- 20	31	97
Chalkyitsik	27	130	100	98	+382	- 23	96	96
Circle	41	54	81	101	+ 32	+ 50	60	74
Fort Yukon	701	448	619	665	- 36	+ 38	442	71
Stevens Village	102	74	96	94	- 27	+ 30	61**	64**
Venetie	107	112	132	129	+ 4	+ 18	129	98
TOTALS	1,111	959	1,126	1,183	- 14	+ 18	884	79
(w/o Ft. Yukon)	(401)	(511)	(507)	(518)	(+ 25)	(- 1)	(442)	(87)

* Birch Creek was not included in the 1970 census. Population estimate cited in Yukon-Porcupine Regional Planning Study, Institute of Social and Economic Research, 1978.

** Figures are from 1980 census data. Dinyee, the Native corporation for Stevens Village, does not believe these figures are accurate. They feel that the Native population is much higher.

satisfy personal and subsistence requirements from a large resource base. Community populations must be dynamic and responsive to change. Mobility and rapid adaption to their environment is the hallmark of Athapaskan culture. This factor must be considered when discussing the population characteristics and dynamics of the Yukon Flats area.

Population Projections. The Institute of Social and Economic Research (ISER) has developed projections of growth in Alaska's population and economy (Goldsmith 1986). Economists at ISER prepare and update these projections periodically. Four projections or cases showing the likely range of future economic and population levels, based upon reasonable assumptions about future revenues, state fiscal policies, resource development, and national economic growth are provided. The assumptions used are based on the best available information and are changed as necessary when new information becomes available. The projections, therefore, do not constitute a "prediction" about Alaska's future, but simply an estimate of future population and economic levels if the assumptions which "drive" the projections turn out to be correct.

For the Upper Yukon region (which includes all the communities discussed with the exception of Stevens Village), the four cases developed by ISER project population growth levels (for the year 2010) ranging from a 17 percent

loss in the least favorable economic model to 34 percent increase in the most favorable economic model.

It is important to note that the base population figures from which projections are made are the most recent figures issued for the state and its census divisions by the Alaska Department of Labor and that the regional projections are based on a simple procedure that allocates total state population to the regions so that regional projections are consistent with the state totals. This procedure does not take into account all possible demographic information for each region. Goldsmith (1986) provides additional detail on the assumptions under each case and how the projections should be interpreted.

Population Composition. A large majority of the regional population, 79 percent, is Native peoples. Most Natives on the Flats are Kutchin Indians, members of the Athapaskan people, though Koyukon Athapaskans and interior and coastal Eskimos are also present in the Native population. Exclusive of Fort Yukon, the regional center of government and economic activities, an even higher percentage of the population is Native (87 percent).

SOCIOCULTURAL SYSTEMS

The Athapaskan peoples of the region have used the lands and resources now in the refuge for many centuries. Although social, cultural, and economic change has been occurring throughout this period, recent decades have seen this change accelerate greatly.

The single most important factor in the recent acceleration of sociocultural changes has been the Alaska Native Claims Settlement Act of 1971. ANCSA created village and regional corporations, providing financial assets and a land base for the Native peoples of the region.

Other significant factors that are now and will continue to affect local residents include the Molly Hootch decision which directs the state of Alaska to provide public school facilities for all villages with at least eight high school students; federal programs which are providing additional housing in the region (often suburban-style houses with technological systems that depend on imported parts and fuels); and satellite communication which is bringing increasing numbers of televisions and telephones to the villages.

Subsistence and Economic Orientations. Cash and subsistence economies are becoming more closely interrelated in the Native society as are traditional and western social needs. Natives are participating freely within segments of both cash and subsistence economies. Variations in people's way of life depends on the degree to which they pursue subsistence activities as opposed to wage activities (ISER 1978). Diverse sets of motivations are important to those who engage in subsistence activities. Technological advances now enable users to obtain subsistence resources more quickly than with traditional techniques. Today, subsistence activities can be successfully pursued even if the individual is employed full-time (ISER 1978).

Acculturation of the Kutchin Athapaskan people of the Yukon Flats has occurred rapidly, changing the pure subsistence economy of the region to a mixed cash/subsistence base. The future trend will probably be away from the subsistence lifestyle (Nelson 1973), although most local residents stress the importance of the subsistence-based socioeconomic system to their way of life

(Caulfield 1983). Subsistence activity in the Yukon-Porcupine region clearly remains an important component in the lives of its residents (ISER 1978).

COMMUNITY INFRASTRUCTURE

Infrastructure is the basic underlying framework or support system for a community. Included within the concept are local government, housing, education, health services, local transportation, water and sewage systems, solid waste disposal, police and fire protection, and communication systems.

Communities in the region generally have similar infrastructures including housing, educational facilities, public health facilities, post offices, small airports, dock facilities along the river, satellite communication facilities (telephone and television), and electricity. In the smaller villages, not everyone has electrical service and water systems are not always adequate.

Fort Yukon, the regional center of government and economic activities, is the only incorporated community in the region. It incorporated as a second class community in 1959. The other villages are unincorporated and have traditional tribal forms of government. Fort Yukon has a mayor-council form of government with a city manager, though the traditional tribal government remains in place. A more complex infrastructure exists here with law enforcement, a library, water and power system, and additional community facilities not found in other communities in the region.

All the communities were eligible for land entitlements under the Alaska Native Claims Settlement Act. Venetie, with Arctic Village, chose to select the lands of the Chandalar Native Reserve and are thus not eligible for other land selection. The communities are members of Doyon, Limited, the regional Native corporation, and the non-profit Tanana Chiefs Conference (TCC), both with offices located in Fairbanks. TCC has a subregional office in Fort Yukon.

ECONOMIC CONDITIONS

Economies of communities in the area are highly dependent on subsistence resources and the infusion of "outside money" to drive local systems. No property or local taxes exist. State and federal government supports much of the basic community infrastructure. Such subsidies allow a resident to exist on a mixed cash and subsistence economy. Fur is the only export item of significance, but few people earn a full time living from trapping.

Employment. Employment statistics for the larger Yukon-Koyukuk census division show an average annual civilian labor force of 2,088 persons, or one percent of the statewide labor force. The average annual unemployment rate is 16.4 percent compared to 9.6 percent statewide. In 1980, peak unemployment was 20.4 percent in March (Alaska Department of Labor 1981). The seasonal nature of much of the employment in the region often conflicts with the opportunity to engage in subsistence activities. The average period of wage employment is usually less than five months.

Many of the professional and skilled positions in the region are filled by non-Natives. The Native work force, in general, lacks the professional and technical people needed to fill skilled positions, especially in government agencies and the school system, major employers in the region (ISER 1978). The high unemployment rate in rural Alaska is reflective of this fact. The

younger, better educated people tend to move out of the communities to seek employment elsewhere, leaving the less competitive workers in the villages. Most people want work, but the opportunities are limited in rural Alaska.

Income. The region's communities are primarily inhabited by Athapaskan speaking Natives who engage in a mixed cash and subsistence economy. Much of the cash income supporting the economy is generated through seasonal wage labor, such as fire fighting for the Bureau of Land Management. Other forms of cash income include trapping and transfer payments. Unemployment insurance also provides cash income as residents who leave a wage job to participate in subsistence activities are eligible for these payments in the State of Alaska. The cash income of Natives and other residents is an essential part of the mixed economic lifestyle present in the Yukon Flats region. Cash expenditures are necessary to successfully compete for subsistence resources as opportunity costs escalate. Improved technologies which allow for greater efficiency in renewable resource exploitation has resulted in increasing cash expenses. Cash is needed for purchasing firearms, ammunition, fishing gear, snow machines, boats, and associated materials and maintenance costs.

Subsistence activities are the other vital part of the local economy in the region. Although Kutchin Athapaskans generally "place a high value on money and dislike the discomforts of life out in the bush" (Nelson 1973), the lack of regular employment (as well as cultural and historic ties) make subsistence activities a necessary and integral part of daily life for local residents. The subsistence portion of this economy consists of food products, firewood, and other materials taken directly from the land for local consumption. Although subsistence is often viewed as a biological, social, and cultural issue, the pure economics of the lifestyle are quite important. Subsistence resources and activities are discussed in more depth in the following section.

SUBSISTENCE

Subsistence uses are defined in the Alaska National Interest Land Conservation Act (ANILCA) as "the customary and traditional uses by rural Alaska residents of wild, renewable resources for direct personal or family consumption as food, shelter, fuel, clothing, tools or transportation; for the making and selling of handicraft articles out of nonedible byproducts of fish and wildlife resources taken for personal or family consumption; for barter, or sharing for personal or family consumption; and for customary trade." Thus virtually all harvest of refuge resources by local residents potentially qualifies as subsistence use. Lacking further definition, all local harvests are considered to be subsistence (for the purpose of the plan). Fish, wildlife, and vegetative materials are harvested on the Yukon Flats Refuge by residents of all the communities within and near the refuge.

Information on the subsistence activities of the residents of Birch Creek, Chalkyitsik, Fort Yukon, and Venetie was taken primarily from the Caulfield study of subsistence use in the upper Yukon-Porcupine region done for the Alaska Department of Fish and Game, Division of Subsistence (Caulfield 1983). Members of the planning team and refuge staff visited each community to review the information in Caulfield's report with the local residents. Minor modifications of the areal extent of some subsistence activities occurred as a result of these visits.

State-sponsored subsistence studies have not been completed in Beaver, Circle, or Stevens Village. To gather information on subsistence activities for these communities, planning team members and refuge staff, with a representative of the Tanana Chiefs Conference, visited each community. Meeting with local residents, data was gathered on the areal distribution of certain subsistence activities, primarily trapping, for these communities. Though only preliminary to more extensive state-supported studies, it provides the planning team with an initial indication of what effects various management options may have on the subsistence activities of these communities. Residents of Beaver and Stevens Village were very helpful, providing significant information on their use of refuge resources. The meeting in Circle produced only limited information, thus the discussion of subsistence activities for Circle is limited and comes primarily from an earlier study by Caulfield (1979) done for the National Park Service. Figure 17 summarizes the regional distribution of subsistence activities on and near the refuge.

Birch Creek. The community of Birch Creek, located on the north bank of the lower mouth of Birch Creek, is the smallest community on the refuge with a population of 32 (1980). It lies 26 air miles southwest of Fort Yukon. The community is surrounded by extensive lake, river, and slough systems characteristic of the Yukon Flats. Birch Creek flows circuitously through extensive areas of black spruce forest, brush, and muskeg before reaching the Yukon River. Larger spruce and birch are scattered throughout the area. To the south are gently-rising uplands drained by small creeks originating in the White Mountains, where peaks rise to over 5,000 feet (1,500 m) in elevation.

Land and resource use by Birch Creek residents focuses on the extensive lake, river, and slough systems. Canoe portages, between Birch and Beaver creeks, between Birch Creek and the Yukon River, and between many smaller lakes and streams, are essential to this pattern of use. In upland areas, trail systems known to locals are used for trapping and hunting. Distribution of subsistence activities by residents of Birch Creek is shown in Figure 18.

Most moose and black bear hunting by Birch Creek residents occurs on Birch Creek from the upper and lower mouths on the Yukon River upstream to the Steese Highway, along the Yukon between White Eye and Fort Yukon, and on Beaver Creek. Salmon fishing occurs primarily at the lower mouth of Birch Creek on the Yukon River, while fishing for whitefish, grayling, sheefish, and pike is done at specific net sites along Birch Creek and its tributaries and in lakes near the community. Grayling fishing with hook-and-line often occurs in conjunction with hunting, extending the length of Birch Creek to the Steese Highway bridge.

Muskrat and waterfowl hunting occur primarily on the large number of lakes, rivers, and sloughs immediately surrounding the community and extending downriver to the Yukon. The large lakes south of Birch Creek village are particularly productive waterfowl hunting areas. Furbearer trapping takes place along established trails to the south running into the foothills of the White Mountains near the headwaters of Preacher Creek, along the upper and lower mouths of Birch Creek, and to the west along Beaver Creek. Gathering of firewood, berries, and house logs generally occurs at specific sites near the community and upriver along Birch Creek.

Chalkyitsik. Located at the eastern edge of the Yukon Flats about 50 miles east of Fort Yukon, Chalkyitsik has a population of 100 (1980). Chalkyitsik is situated on the Black River, at a site traditionally important for fishing. Much of the resource harvest activities of local residents

Figure 17. Regional distribution of subsistence activities. (Sources: Caulfield 1983, FWS Planning Team.)

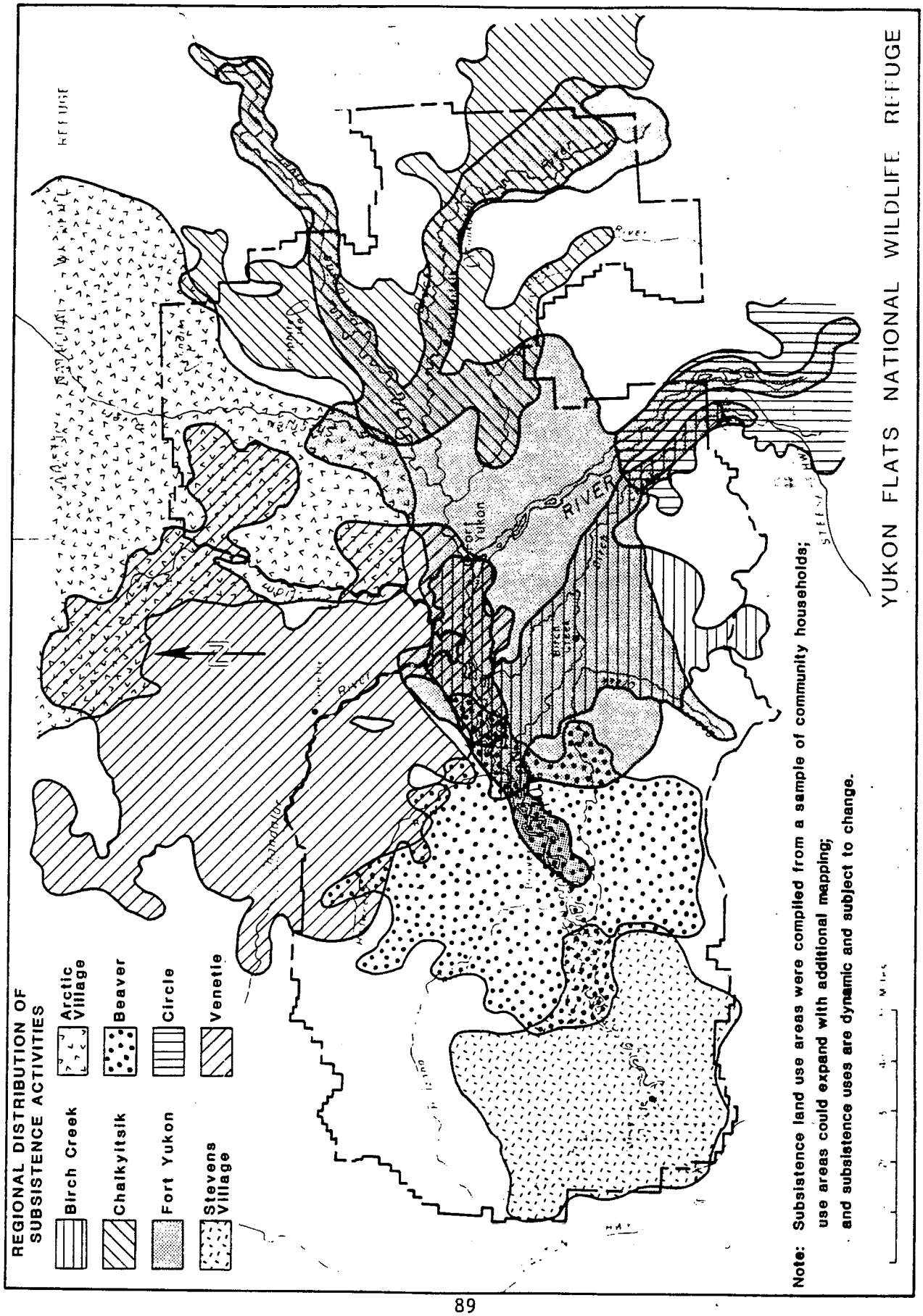
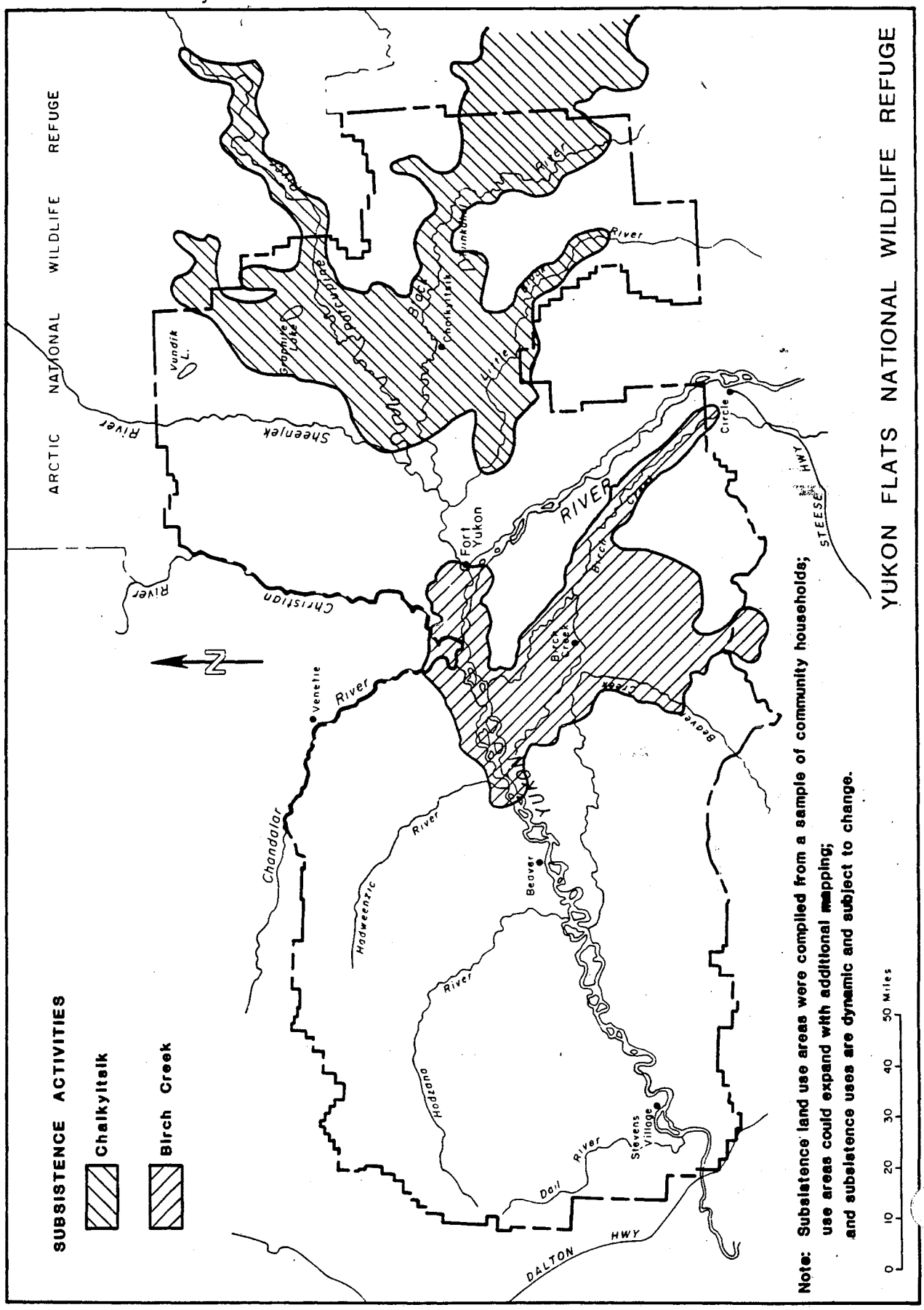


Figure 18. Distribution of subsistence activities - Birch Creek and Chalkyitsik. (Source: Caulfield 1983.)



focuses on the Black River which originates in the rugged uplands which surround the Flats to the east and south. Just upriver from Chalkyitsik the river begins to change character and blend into the maze of sloughs, lakes, and streams which make up the Flats. A number of large lakes, including Ohtig and Tiinkdhul, are situated near the Black River and are used for hunting, fishing, and trapping. North of the community, the Porcupine River flows southwesterly from Canada to its confluence with the Yukon River. In winter, a trail is broken from the village to the Porcupine River, providing access to important hunting, fishing, and trapping areas. The distribution of subsistence activities by residents of Chalkyitsik is shown in Figure 18.

Moose hunting activity generally occurs on the Black River (including the Salmon Fork), on the Porcupine River, and in grassy, meadow-like areas to the south of Chalkyitsik. On the Black River, hunters travel by boat, generally from the vicinity of "Englishshoe Bar" upstream to Kiivinjik Creek on the Salmon Fork. Moose are taken by trappers at outlying camps on the Black, Little Black, and Porcupine Rivers. Black bear are generally hunted over the same range as are moose. Caribou are harvested occasionally by Chalkyitsik residents on the Porcupine River and near the headwaters of the Salmon and Grayling forks of the Black River. Caribou have, as in 1982, infrequently migrated close to Chalkyitsik thus allowing harvest near the village.

Trappers from the community travel considerable distances on the Black, Little Black, Salmon Fork, Grayling Fork, Porcupine, and Coleen rivers in search of fur. Muskrat and waterfowl harvest activities are centered in the extensive lake, slough, and creek systems found from the area just north of the Porcupine River south to the vicinity of the Little Black and Grass rivers. Ohtig Lake is a particularly productive waterfowl hunting area.

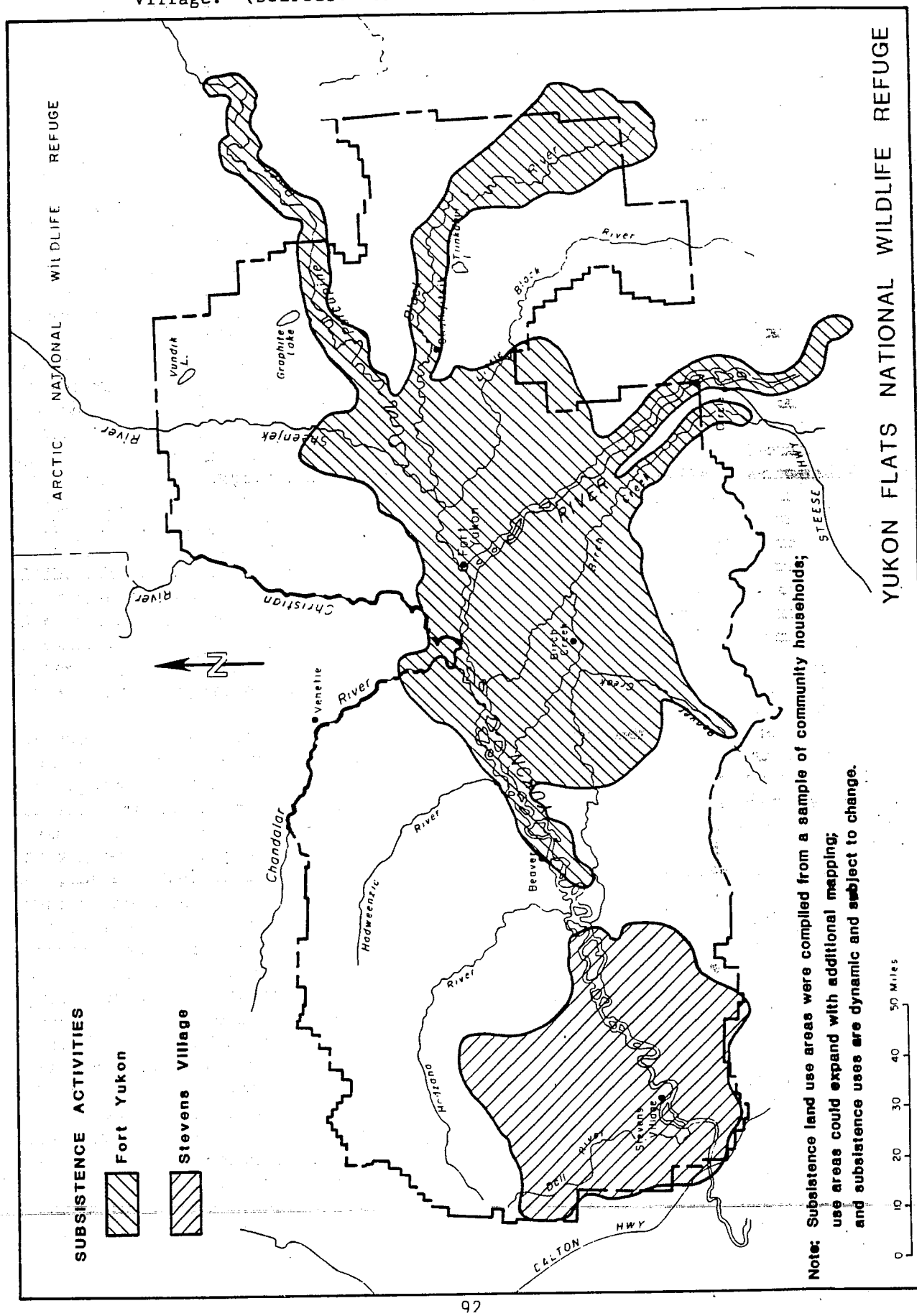
The Black River and its tributaries are the most productive sources of fish for local residents. Salmon, whitefish, burbot, and pike are caught with gillnets in the main river. Grayling are also taken, both in nets and with hook-and-line. Pike and whitefish are taken in large lakes near the community.

Fort Yukon. Largest of the regional communities with a population of 619 (1980), Fort Yukon is located near the confluence of the Yukon and Porcupine rivers. It has served as an important transportation, trading, supply, and administrative center for the upper Yukon-Porcupine region. Its central location in the Flats has fostered expansive land and resource use patterns. It is surrounded by a vast lake-covered flood plain containing bottomland spruce-poplar and lowland spruce-hardwood forests, lowbrush bog, and muskeg. The Flats provide abundant habitat for aquatic species such as muskrat, beaver, whitefish, and waterfowl. The Yukon and Porcupine rivers serve as transportation corridors, providing access to upland areas. Figure 19 depicts the distribution of subsistence activities by residents of Fort Yukon.

Areas used for moose and bear hunting include the Yukon, Porcupine, lower Sheenjek, and Black rivers, and Birch Creek. Generally, moose hunting occurs downriver on the Yukon to Beaver and upriver to above Circle. On the Porcupine, activity was reported as far up as Old Rampart. Hunters from Fort Yukon also use the Black River below "Englishshoe Bar" and Birch Creek from its lower mouth to the Steese Highway. Caribou hunting usually only occurs on the Porcupine River in the vicinity of Old Rampart and Canyon Village, though infrequent migrations occur which result in hunting in other areas (such as along the Yukon River upstream to Circle as in 1982).

Salmon fishing by Fort Yukon residents occurs mainly along the Yukon River. A number of fish camps are concentrated 12 to 16 miles downriver of Fort Yukon.

Figure 19. Distribution of subsistence activities - Fort Yukon and Stevens Village. (Sources: Caulfield 1983, FWS Planning Team.)



Others are scattered upriver to Twentytwo Mile Village. Other species, such as whitefish, pike, grayling, burbot, and sheefish, are caught on the Yukon, Porcupine, Sheenjek, Black, Grass, and Sucker rivers and on nearby lakes.

Trapping by residents of Fort Yukon occurs up the Porcupine River to Shuman House, up the Yukon River to Twentytwo Mile Village, and on the Grass, Sucker, and Little Black rivers. Several trappers based in Fort Yukon use areas on the upper Black River, while others run traplines on Birch and Beaver creeks. Fort Yukon also serves as a supply center for households living full-time near distant traplines throughout the region, including those on the Coleen, Sheenjek, Porcupine, Chandalar, and Black rivers. This use is not community-based and was not included on the maps prepared for the study.

Waterfowl hunting occurs over much the same area as moose hunting, though it does not extend as far upstream on the Yukon River (only to Twentytwo Mile Village) or the Porcupine River (only to near Shuman House). The lakes and sloughs around Fort Yukon are used extensively for waterfowl hunting.

Venetie. The community of Venetie is located on the north side of the Chandalar River, 45 air miles northwest of Fort Yukon and about 45 miles by river from the mouth of the Chandalar. It has a population of 132 (1980). Venetie's location, on the Yukon Flats near the foothills of the Brooks Range, provides access to resources found in the extensive lake, river, and slough systems of the Yukon Flats as well as those of the upland region. Upriver from the village, the East and Middle Forks of the Chandalar River extend into the treeless alpine tundra regions of the Brooks Range. To the east the Christian River flows circuitously from the uplands between the Sheenjek and Chandalar rivers to its confluence with the Yukon a few miles below Fort Yukon. The Yukon Flats extend to the west of Venetie, toward a cluster of small lakes, and to the Hadweenzic and Hodzana rivers. The Chandalar River flows southeasterly past Venetie toward its confluence with the Yukon. Figure 20 depicts the distribution of subsistence activities by the residents of Venetie.

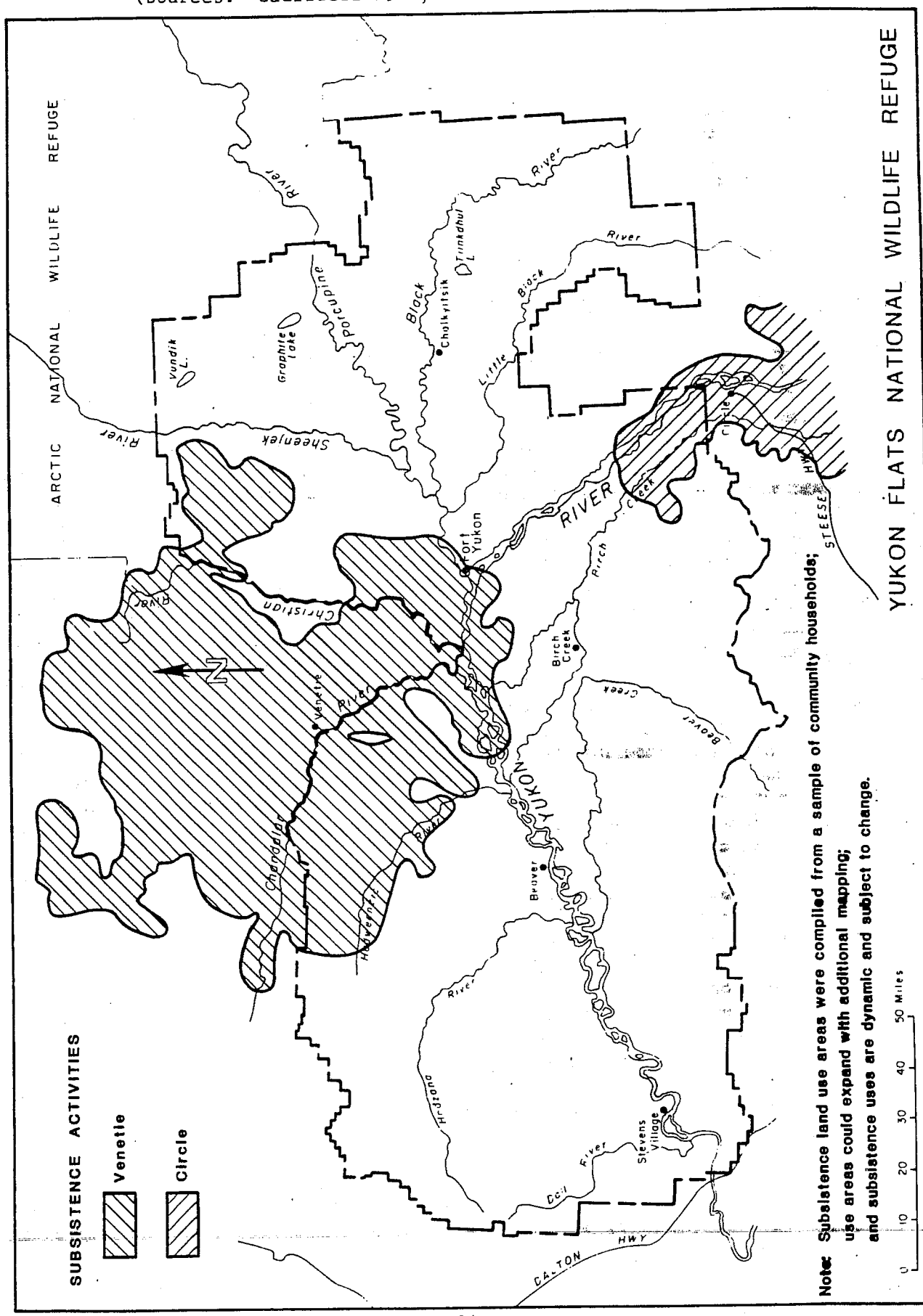
The area of use identified by Venetie residents extends from fish camps on the south side of the Yukon River near the mouth of the Chandalar River north to the East Fork of the Chandalar near Big Rock Mountain. The use area extends west of the Chandalar River to include the lakes area near the Hadweenzic River and then north to include the Ackerman Lake area and the Middle Fork of the Chandalar.

In the past, areas of the Middle Fork drainage above of Ackerman Lake have been used for trapping and for sheep, moose, and caribou hunting. Use of the East Fork drainage, primarily for hunting moose and caribou and for trapping, is concentrated at Gold Camp and downriver from Big Rock Mountain and Brown Grass Lake. Low water during the fall usually restricts moose hunting on the main course of the Chandalar to areas downstream of the Middle and West forks.

Christian Village is used as a seasonal trapping camp and for moose and caribou hunting. Trapping from Christian Village extends as far east as Kwittevunkid Lake and Alexander's Village. Both Venetie and Arctic Village trappers use this area. The extensive lake and slough systems lying between the Christian and Chandalar rivers are utilized for fishing, trapping, hunting, and gathering activities.

Beaver. The community of Beaver, located on the north bank of the Yukon River some 65 air miles west of Fort Yukon, has a population of 66 (1980). It is surrounded by extensive lake, river, and slough systems characteristic of the Yukon Flats. Black spruce forest, brush, and muskeg are common. To the

Figure 20. Distribution of subsistence activities - Venetie and Circle City. (Sources: Caulfield 1983, Caulfield 1979.)



north are the uplands of the Hodzana and Hadweenzic drainages. Figure 21 depicts the distribution of subsistence activities by the residents of Beaver.

Moose and other large game, as well as waterfowl, are hunted primarily in the area across the Yukon from Beaver between the Yukon River and Beaver Creek. Moose hunting is done primarily by boat along water courses in this area. Fishing occurs in the Yukon and its major tributaries where currents are strong enough to operate a fish wheel. Most salmon fishing is done in the Yukon, particularly at the mouth of sloughs across from Beaver and at White Eye upstream from Beaver. Use on the Yukon and its extensive slough system occurs upstream nearly to Venetie Landing while downstream use occurs as far as the vicinity of Kings Slough Village (preliminary findings from the ADF&G Division of Subsistence study recently initiated in Beaver indicate that local residents also hunt and trap in the vicinity of Moose Island, further downstream than was indicated in preliminary work undertaken by the Service).

Furbearer trapping takes place along established trails running north into the Hadweenzic and Hodzana drainages and south into the Beaver Creek area and the White Mountains. Wood gathering generally occurs upriver from the community where rafts can be used for hauling or it occurs near the community where overland hauling is relatively simple.

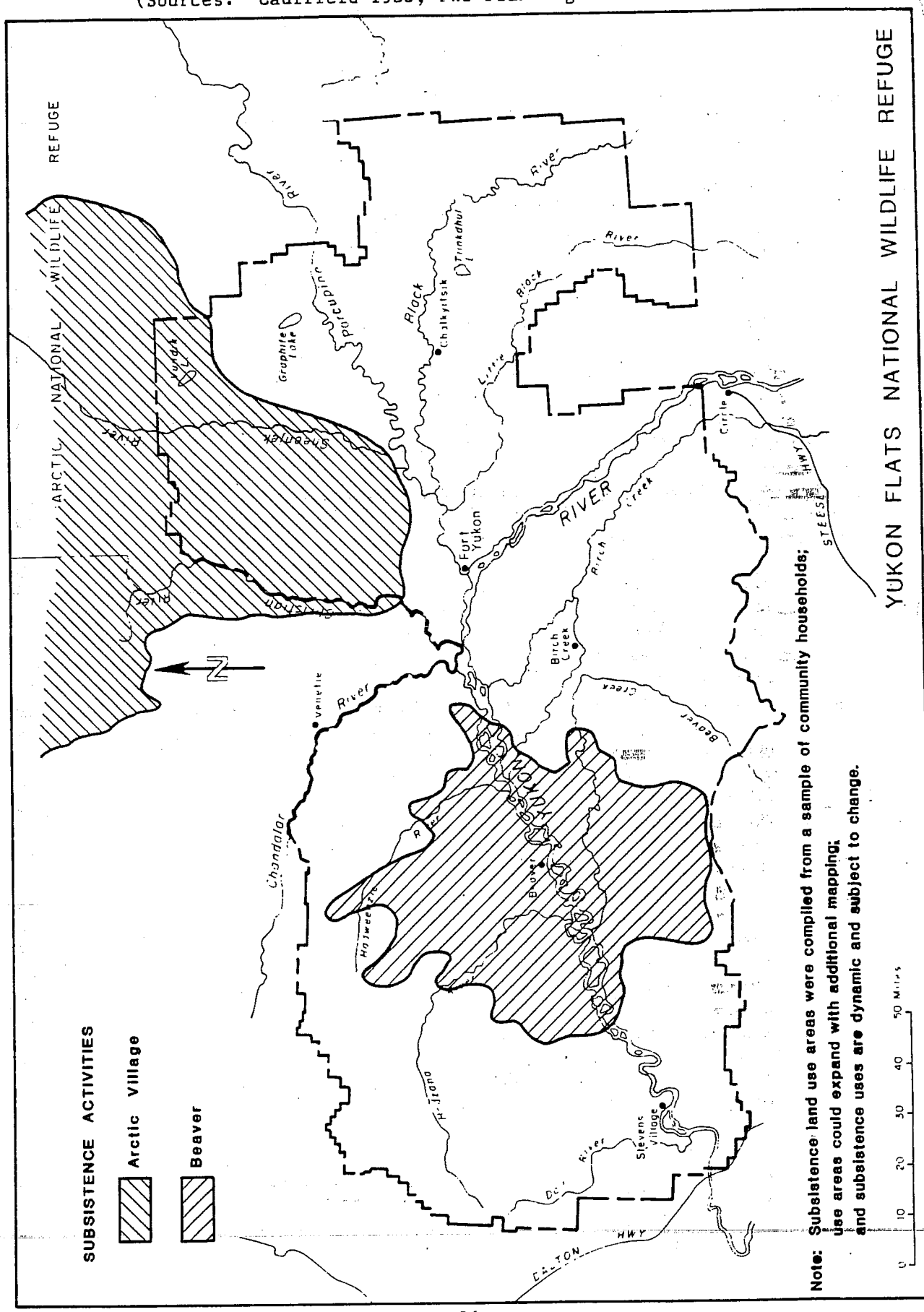
Stevens Village. Located on the north bank of the Yukon River, Stevens Village has a population of 96 people (1980). Approximately 120 air miles southwest of Fort Yukon, Stevens Village is the westernmost community on the refuge (some 22 river miles upstream from the Yukon River Bridge on the Dalton Highway). Upstream of the community, the Yukon River flows through the western Yukon Flats characterized by an extensive system of lakes, rivers, and sloughs. Downriver, the Yukon carves its way through rugged hills of up to 4,000 feet which form its "lower ramparts." To the north lies the Dall River drainage and the southern portion of the Hodzana Highlands. The distribution of subsistence activities for Stevens Village is shown in Figure 19.

Preliminary data gathered in the spring of 1984 indicate that residents of Stevens Village utilize most of the southwestern portion of the refuge including much of the Dall River drainage and the highlands south of the Hodzana River. Use on the Yukon River extends upriver beyond Marten Island and Purgatory while downstream use extends to the Dalton Highway and beyond. Preliminary data focused primarily on furbearer trapping and moose hunting, so additional data collection could alter the areal pattern of use.

More recent information provided by the ADF&G Division of Subsistence indicates that the Stevens Village resource use area extends upriver to the community of Beaver. Fall moose hunting occurs primarily along the main channels and sloughs of the Yukon River. Winter hunting takes place along the river as well as throughout the flats and surrounding foothills, in conjunction with trapping activities. Black bears are harvested primarily along certain portions of the flats north of the community. Small game is harvested throughout the area, often in conjunction with other activities. Salmon fishing camps are downriver from the community along the canyon to below the Dalton Highway bridge.

Circle City. Located on the Yukon River approximately ten river miles upstream from the refuge's southern boundary, Circle City has a population of 81 (1980). The last bluff of the Yukon's "upper ramparts" end just across from Circle; just below are the islands and sloughs which characterize the Yukon Flats. Land and resource use by Circle residents is a split between the hills

Figure 21. Distribution of subsistence activities - Beaver and Arctic Village. (Sources: Caulfield 1983, FWS Planning Team.)



and bluffs upstream and the flat country downstream. Subsistence use areas identified from this information are shown in Figure 20.

Activities occurring on the refuge consist primarily of salmon fishing on the Yukon River, moose and bear hunting along the Yukon and on Birch Creek, and trapping of beaver and other furbearers on Birch Creek. The areal extent of these and other subsistence activities on the Yukon Flats Refuge was not well documented in the study (Caulfield 1979) which emphasized the Yukon-Charley rivers upstream of Circle. Only a brief visit (five days) was made to Circle.

Arctic Village. Though not specifically discussed in this plan, Arctic Village does utilize a small portion of the refuge for subsistence activities, primarily furbearer trapping. This use occurs in the northeastern portion of the refuge in the area around Christian Village, the Sheenjek River, and Vundik Lake. Figure 21 shows this distribution as defined by Caulfield (1983).

Annual Cycle. The annual cycle of resource harvest activities, as shown in Caulfield (1983), is depicted in Figure 22 for the communities of Birch Creek, Chalkyitsik, Fort Yukon, and Venetie. The data presented in this summary were compiled from interviews with local resource experts and from observations by the author. The annual cycle summary reflects the period from 1970 to 1982 and includes only major activities. Subsistence activities and when they occur may vary from year to year. The annual cycles for the other villages would be similar to the cycles depicted here.

ACCESS AND TRANSPORTATION

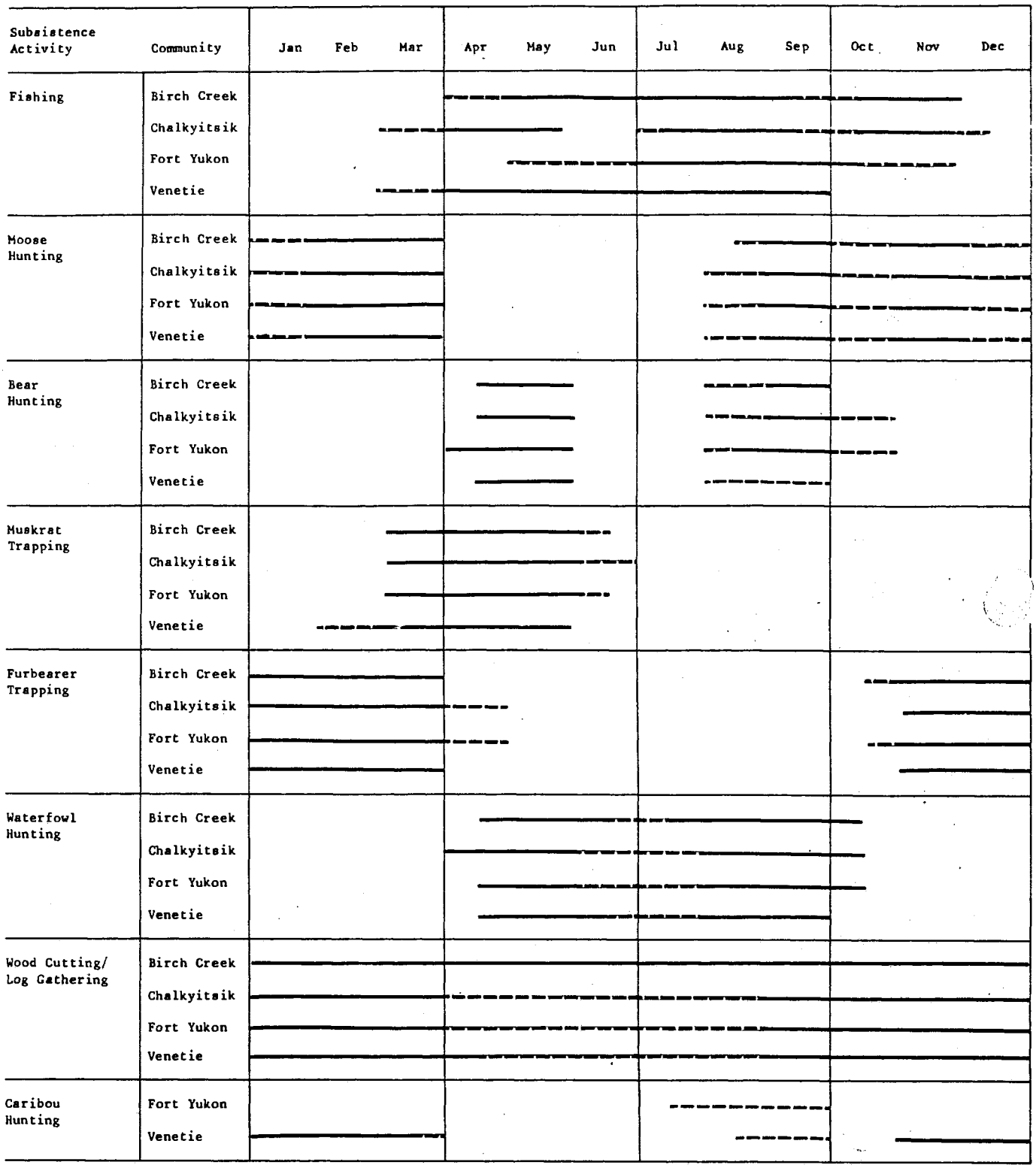
The accessibility of refuge lands is influenced by natural features such as lakes, rivers, terrain, vegetation types, and by human influences such as roads, trails, seismic lines, and regulations. The availability and character of access directly influence use of the refuge. Access to the refuge is primarily by air and water. Limited overland travel occurs on the refuge, primarily during the winter months.

Air Access. Scheduled commercial and charter air service is available to all the refuge communities. A few constructed airstrips, as well as numerous lakes and sand or gravel bars, make most areas of the refuge accessible by light aircraft. No areas of the refuge have been closed to the landing of fixed-wing aircraft. See Figure 23 for the location of major airstrips.

Water Access. Boats are used extensively for summer travel on the refuge with all major rivers and streams being used. Local residents use river boats for hunting, fishing, and other subsistence activities and for travel to and from fish camps and allotments and between communities. River boats, canoes, and other small watercraft are used for river floating and other recreational activities on most of the major drainages in the refuge. Some commercial barge activity also occurs on the refuge, primarily on the Yukon River, carrying supplies to many of the communities along the river.

Rivers and streams on the refuge which are used heavily for commercial, subsistence, and recreational access include the Dall and Little Dall rivers, the Hodzana River to Pitka Fork, the lower stretches of the Christian and Grass rivers, all of the Yukon, Porcupine, Chandalar, and Sheenjek rivers, all of Beaver Creek and Birch Creek (including the Lower Mouth), and the Black River.

Figure 22. Annual cycle of subsistence activities, Yukon Flats Refuge. Source: Caulfield 1983.

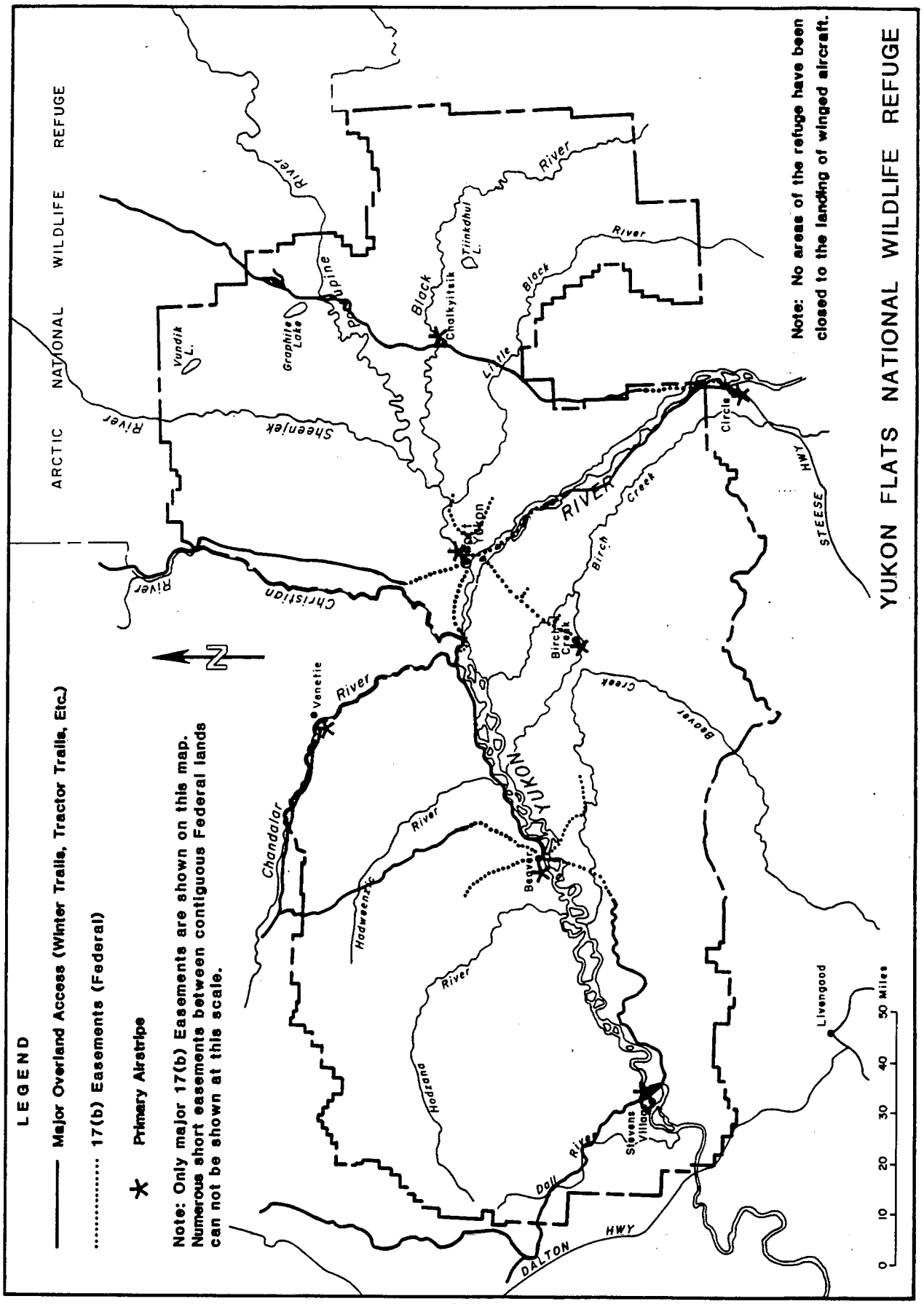


Primary Activity ———

Secondary Activity - - - -

Source: Caulfield, Richard A. 1983. Subsistence Land Use in in Upper Yukon-Porcupine Communities, Alaska. Alaska Department of Fish and Game, Division of Subsistence. Fairbanks, Alaska.

Figure 23. Major air and overland access on the Yukon Flats Refuge and public access (17(b)) easements across Native corporation lands.



Other rivers, streams, and water bodies on the refuge are also used by local residents for subsistence activities.

Overland Access. Road access into the refuge does not exist. The Steese Highway to Circle and the Dalton Highway south of the Yukon River Crossing are the nearest points to the refuge accessible via automobile. Automobile use is restricted to areas near communities on the refuge (on private inholdings). No roads exist between the communities. Overland travel during the winter is common with snowmobile, three-wheeler, and dogsled use associated with trapping, firewood gathering, and other subsistence activities. Some overland (and over ice) travel between communities occurs during the winter months, including recreational uses such as the Fort Yukon to Chalkyitsik snowmobile race. Major overland trails on the refuge are shown in Figure 23.

Dalton Highway. The Dalton Highway corridor lies adjacent to the refuge along its southwestern boundary. Several material sites along the highway (all outside of the refuge) are used by the Department of Transportation and Public Facilities for road repair and maintenance activities.

Revised Statute (RS) 2477 Rights-of-Way. Revised Statute 2477 (formerly codified as 43 U.S.C. 932; enacted in 1866) provides that "The rights-of-way for the construction of highways over public lands, not reserved for public use, is hereby granted." The act was repealed by P.L. 94-579 as of October 21, 1976, subject to valid existing claims. The State of Alaska has identified a number of such possible transportation rights-of-way that have been historically used on refuge lands. If, in the future, these rights-of-way are determined to be valid in a court of competent jurisdiction, they could be developed as transportation corridors by the State. A list and map of these possible RS 2477 rights-of-way (not necessarily all inclusive) is included in this plan as Appendix J.

Public Access (17(b)) Easements across Corporation Lands. Public easements have been reserved on inholdings conveyed to Native corporations under the Alaska Native Claims Settlement Act (ANCSA). These easements, as per Section 17(b) of ANCSA, are considered " . . . reasonably necessary to guarantee international treaty obligations, a full right of public use and access for recreation, hunting, transportation, utilities, docks, and such other public uses . . . important." These public easements include linear easements across Native conveyed lands and one acre sites at periodic points along the courses of major waterways flowing through Native conveyed lands.

Easement types reserved and uses allowed include: (1) 25 foot wide trails - uses allowed include travel by foot, dogsled, animals, snowmobiles, two- and three-wheel vehicles, and small all-terrain vehicles (less than 3,000 pounds gross vehicle weight); (2) 50 foot wide trails - uses allowed include travel by foot, dogsled, animals, snowmobiles, two- or three-wheel vehicles, small and large all-terrain vehicles, and four-wheel drive vehicles; (3) 60 foot wide trails - uses include travel by foot, dogsled, animals, snowmobiles, two- and three-wheel vehicles, small and large all-terrain vehicles, track vehicles, four-wheel drive vehicles, automobiles, and trucks; and (4) one acre sites - uses include vehicle parking (e.g., aircraft, boats, ATV's, snowmobiles, cars, trucks), temporary camping (limited to 24 hours), and loading or unloading (limited to 24 hours). Use of some trail easements may be restricted to winter use only.

Figure 23 shows the major 17(b) easements which have been reserved to date, though many of these easements can not be depicted at this scale. As all Native conveyances have not been completed, not all the 17(b) easements have been reserved.

RECREATIONAL USE

Subsistence activities (hunting, fishing, trapping, and the collection of vegetative materials) account for over 90 percent of the public use occurring on the refuge. Various recreational activities, centered primarily around sport hunting and river floating, comprise the remaining segment of public use. For the purposes of this discussion, recreation refers to use by people other than residents of the local communities unless otherwise noted.

Recreational use comprises less than 10 percent of the public use on the refuge (less than 1000 visitor days per year). Although past recreational data are scarce, recreational use over the recent past has probably grown only slightly. Hunting opportunities on the refuge are restricted by low moose populations, scenic quality is not outstanding, and access into the area is limited, all of which affect the area's potential for recreational growth. Only with additional developments on private inholdings or the provision of new (or improved) recreational opportunities and facilities on refuge lands will recreational use show any significant growth.

River Floating. Float trips down the boatable rivers in the refuge, coupled with hunting comprise most of the recreational use on the refuge. The most commonly floated rivers include Beaver and Birch creeks and the Yukon, Porcupine, Sheenjek, and Chandalar rivers.

Very little information is available on the recreational use of these rivers. Reliable observations made for the refuge by a family living on Beaver Creek identified 29 individuals in 8 parties who floated that river in 1980. The Fort Yukon Air Taxi operator estimated that 25-30 people floated the Sheenjek River in 1981. In most cases, the 4 to 7 days the floaters spend in the refuge are the terminus of a longer trip originating upstream from the refuge. The most important aspects of the river floating experience are wilderness dependent, including the opportunity to view wildlife and untouched country and to experience solitude, self reliance, adventure, and challenge.

Hunting. The Yukon Flats Refuge is open to both sport and subsistence hunting, subject to state and federal regulations. Very little information is available on hunter effort and harvest in the area. Compliance with Alaska Department of Fish and Game (ADF&G) reporting requirements is low and harvest estimates for the refuge are difficult to extrapolate from ADF&G reports because game management units do not coincide with the refuge boundary. The refuge is within Game Management Unit 25, with portions in Subunits 25A, 25B, and 25D. (See Figure 14.)

The residents of the seven communities in and adjacent to the refuge rely heavily on large and small game found on the refuge. An undetermined, but relatively small, number of non-local hunters travel to the refuge (by aircraft or riverboat) to hunt moose, bear, and other game. Little commercial guiding occurs on the refuge.

Moose - Though the most important game species on the refuge, low population densities throughout much of the refuge and the expense associated with access to the area have significantly restricted recreational moose

hunting on the refuge. Moose harvest in the western portion of Subunit 25D is currently restricted to residents of Subunit 25D under a registration permit hunt. Without a significant increase in the moose population, sport hunting for moose is not likely to increase significantly.

Bear - Black bears are the second most frequently taken big game animal on the refuge. Though commonly hunted, most black bears are taken incidental to hunting of other species or while fishing. A few grizzly bears are taken, as well. An estimated five to ten bears are killed by non-local hunters yearly.

Other Game Species - Dall sheep, found in the White Mountains along the refuge's southern boundary, currently receive light hunting pressure, primarily from non-local hunters. Access is the primary factor limiting hunting pressure on Dall sheep. Some increase in hunting may be expected in the future.

Non-local hunters take a few waterfowl in the fall, as do local residents. Because of the area's remoteness from urban centers, most sport hunting for waterfowl is incidental to hunting of other species. Most of the on-refuge hunting of waterfowl is by local residents. Waterfowl from the refuge may provide as many as 400,000 days of sport hunting annually in Canada, Mexico, and the continental United States. It is impossible to estimate the non-consumptive recreational value of migratory birds, but it could equal or exceed the recreational value of hunting.

Caribou, found primarily in the northeastern section of the refuge, are taken in small numbers primarily by local residents though current regulations do not restrict caribou hunting to local residents. Infrequently, major migrations of caribou occur on the refuge. For example, in 1982 numerous caribou from the Porcupine herd migrated across the Yukon River, crossing the refuge to calving grounds in the Arctic Refuge.

Small game, including snowshoe hare, spruce and ruffed grouse, and willow ptarmigan, are hunted on the refuge. Recreational users take a limited amount of small game incidental to other hunting activities, with most small game harvested by locals in the vicinity of villages or while on traplines.

Other Recreation Activities. Both sport and subsistence fishing are allowed on the refuge, subject to Alaska fishing regulations. Nearly all the salmon caught on the refuge are taken with set nets and fish wheels by local residents. A limited amount of fly-in sport fishing occurs, but most sport fishing is incidental to other recreational activities such as river floating and hunting. The Dall River is probably the heaviest used sport fishing area on the refuge because of its accessibility from the Dalton Highway.

Trapping accounts for a significant portion of the public use on the refuge, but very little of this activity is by non-locals. Trapping is done for subsistence purposes or to generate the cash needed to support the subsistence lifestyle.

Camping, wildlife observation, photography, hiking, airplane sightseeing, and numerous other activities occur on the refuge, both by local and non-local residents. These activities generally take place in conjunction with hunting, river floating, or fishing.

ECONOMIC USE

Trapping. Fur trapping provides the only significant export item in the Yukon FLats region, though revenues can vary greatly from year to year depending on harvest levels and fur prices. The economic value of furbearers

can be substantial as nearly all of the Yukon Flats refuge and its inholdings provide habitat for furbearers.

Historically, beaver have been the most important furbearing animal in the Yukon region. Muskrats have also been significant, exceeding the value of beaver in some years. The key to profits has often been the abundance of beaver and muskrat (the size of the harvest), not necessarily the per unit price of the pelts. Lynx is probably the most important furbearer in the region today, with the Yukon Flats area providing the most abundant harvest of lynx in the state.

Over the years, trapping has been the activity people returned to after short periods of wage-labor provided by road construction, mining, fire fighting, military service, and other limited wage opportunities. Despite variations in prices paid for furs, the trapping opportunity has been consistently available. Today trapping remains a highly labor-intensive activity, demanding long hours and hard work for relatively small and often uncertain returns for the investment costs.

Trapping activities are cyclic in nature, often responding to the rise or fall of fur prices. Trapping has generally been on the decline since World War II, due to competition from synthetics and ranch furs. Nevertheless, data compiled from a joint BSFW-Doyon, Ltd. subsistence survey in 1973 indicated that with the current (1973) prices of fur $900,000 could be generated by trapping in the Yukon Flats in 1973 (DOI 1974). Resident trappers at that time did not rely on the activity as their sole source of cash income. It remains today a part-time occupation for many people participating in the traditional subsistence lifestyle.

Other Uses. Other economic activities on the refuge have been limited in recent years. There is little interest in commercial guiding on the refuge with only one special use permit issued for this activity in 1984.

Only limited commercial fishing activity occurs on the refuge. Table 12 identifies the number of commercial fisheries entry permits held by residents of villages on the Yukon Flats, though several of these permittees operate off the refuge.

A limited amount of commercial shipping (by barge) occurs on the Yukon. A few freight trips per year are made, generally between Nenana and Fort Yukon, although some barge activity also occurs between Circle and Fort Yukon. In addition, bonded freight is shipped from Dawson or Whitehorse, The Yukon Territory, via the Yukon and Porcupine rivers to Old Crow. This navigational use of the Yukon and Porcupine rivers by Canada is guaranteed under the Treaty of Washington between the United States and Great Britain, dated May 8, 1871.

Table 12. Commercial fisheries entry permits, Yukon Flats area, 1982. Source: Geiger et al. 1982.

Village	Gill Net Permits	Fishwheel Permits
Stevens Village	1	2
Circle City	2	0
Fort Yukon	0	1

WILD AND SCENIC RIVERS

The Alaska National Interest Lands Conservation Act established the upper portion of Beaver Creek (127 river miles) as a component of the National Wild and Scenic River System. The initial 111 mile wild river segment of Beaver Creek flows through a portion of the White Mountains National Recreation Area, administered by the Bureau of Land Management. The final 16 mile segment flows through a portion of the Yukon Flats National Wildlife Refuge, administered by the U.S. Fish and Wildlife Service. A river management plan, jointly prepared by the two agencies, was approved in December, 1983. The river, including the designated river corridor, is managed under the policies and guidelines developed in this management plan. Beaver Creek has been determined to be a navigable river from its mouth upstream to Victoria Creek (just upstream of the refuge boundary).

Two other refuge rivers, the Sheenjek and Porcupine, were designated by ANILCA as study rivers for possible inclusion in the National Wild and Scenic River System. Draft study reports have been completed by the National Park Service (NPS) on both rivers. Final reports, including recommendations on designation, are currently being prepared by the NPS. In the draft reports, the initial finding was to recommend the Sheenjek for designation as a National Wild River and not to recommend the Porcupine for designation. Both the Sheenjek and Porcupine rivers have been determined to be navigable rivers within the boundaries of the refuge.

WILDERNESS QUALITIES

Background and Legal Requirements. Section 1317 of ANILCA directs the Service to study all of the non-wilderness lands in the Alaska refuges and recommend areas suitable for inclusion in the National Wilderness Preservation System (NWPS). Section 4(a) of the Wilderness Act states that "The purposes of this Act are hereby declared to be within and supplemental to the purposes for which . . . units of the . . . national wildlife refuge systems are established and administered . . ." None of the lands under federal jurisdiction (8.48 million acres) within the boundary of the Yukon Flats Refuge was designated as wilderness by ANILCA.

After completion of the CCP/EIS and Wilderness Review for the Yukon Flats Refuge, the Service's recommendations for wilderness designation will be sent to the Secretary of the Interior. The Secretary's wilderness recommendation then will be forwarded to the President. The President must send wilderness recommendations to Congress by December, 1987. Only Congress can designate part or all of the refuge as wilderness.

Criteria for Wilderness Review and Evaluation. Most of the criteria for evaluating the wilderness qualities of refuge lands are based on the Wilderness Act of 1964 which defines wilderness as follows:

> A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its

natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historic value.

Seven criteria, based on the Wilderness Act, have been developed to evaluate the wilderness qualities of the wilderness review units. These criteria are described below.

Size. The Wilderness Act requires that a wilderness be 5,000 acres or be large enough to allow for its preservation and use in an unimpaired condition.

Land Ownership. Only areas where the federal government owns both surface and subsurface rights are suitable for wilderness designation. Specifically, conveyed lands and lands with encumbrances in the refuge are unsuitable for wilderness designation. Selected lands may or may not be suitable for designation depending on the final determination of the land status. About 76 percent of the land within the refuge boundary is administered by the federal government and is eligible for wilderness designation. (Current land status is discussed at the beginning of this chapter.)

Natural Integrity. This criterion refers to the degree to which an area retains its primeval character and influence from an ecological perspective.

Apparent Naturalness. Apparent naturalness refers to the degree to which a landscape appears natural and unaffected by human activities.

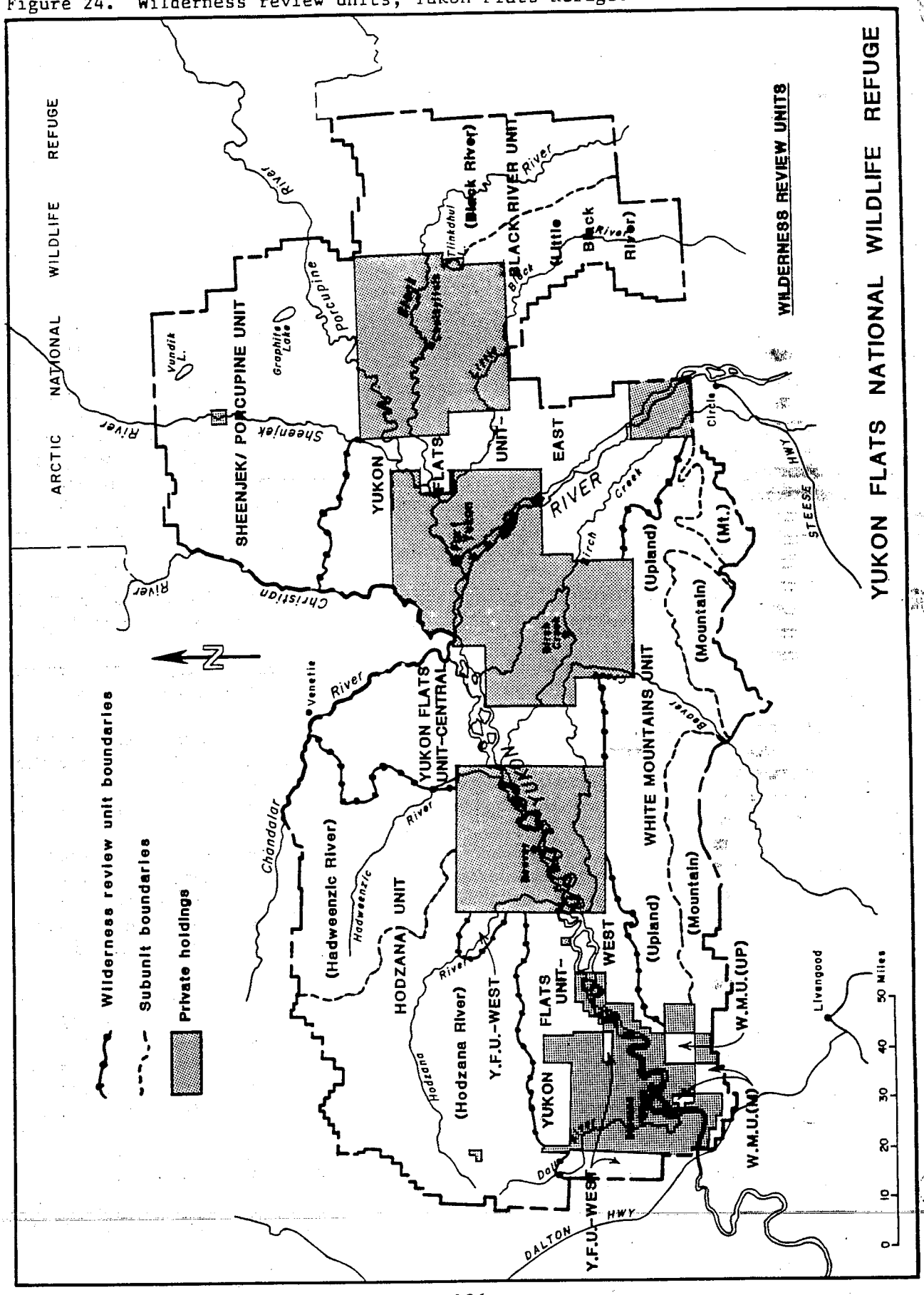
Outstanding Opportunities for Solitude. Solitude refers to the degree of isolation from the sights, sounds, and presence of others. According to the Wilderness Act, a wilderness must provide either "outstanding" opportunities for solitude or "outstanding" opportunities for primitive recreation.

Outstanding Opportunities for Primitive Recreation. To experience primitive recreation, visitors should perceive a vastness of scale, feel they are a part of the natural environment, and experience a high degree of isolation, challenge, and risk. Primitive recreation requires outdoor skills and meeting nature on its own terms without comforts or convenience facilities.

Special or Unique Features. This criterion refers to special ecological features (e.g., threatened or endangered species, wilderness dependent species, unusual plant or animal communities), landforms that represent significant examples of geologic processes (e.g., natural bridges, mass movement areas, caves, lava flows, glaciers), scenic values, and cultural features. Special features are optional in wilderness areas. The Wilderness Act states that wilderness areas "may" have these features.

Evaluation of Wilderness Review Units. For the purposes of evaluation, the refuge has been divided into five wilderness review units: the White Mountains Unit, the Hodzana River Unit, the Black River Unit, the Flats Unit, and the Sheenjek/Porcupine Unit. Figure 24 displays these units.

Figure 24. Wilderness review units, Yukon Flats Refuge.



White Mountains Unit. The white limestone mountains which dominate this unit are very scenic and rugged. Access into the area is difficult and limited. This isolation has protected the White Mountains from human development. Few people come here and none stay long. During the summer water is scarce to nonexistant in the high country. The porosity of the limestone in the area causes the limited amount of rainfall in the area to drain rapidly away.

The only population of Dall sheep on the refuge, numbering about 75 animals, is found in the White Mountains. Caribou, moose, grizzly and black bear, waterfowl, wolves, and lynx are also found in this unit. The American peregrine falcon is a user of this unit, although no active peregrine nests have been confirmed within the unit.

The area of the unit east of Preacher Creek includes the Crazy Mountains. Though less scenic than the White Mountains, this area has been an important wintering area for portions of the Porcupine and Forty Mile caribou herds.

Due to its remoteness from settlement, the lack of abundant fur animal populations, and limited gold resources, much of this area has received little use historically. Recreational use, because of the area's remoteness and lack of access, is extremely light. Beaver Creek, a designated National Wild River (primarily in the White Mountains National Recreation Area (NRA)), flows through the unit onto the Yukon Flats, eventually emptying into the Yukon River near White Eye. Recreational use on Beaver Creek is increasing, but at a relatively slow rate.

The White Mountains unit lies adjacent to two federal conservation units administered by the Bureau of Land Management, the White Mountains NRA and the Steese National Conservation Area (NCA). Management plans for these areas have recently been completed. Lands adjacent to the refuge have been designated either primitive or semi-primitive motorized. The primitive classification will preserve the wilderness qualities of those areas, while the less restrictive semi-primitive motorized designation will allow for limited development. Increasing recreational use is expected in these conservation units, though access to the refuge will remain difficult.

Though lacking prime waterfowl habitat, this area is truly outstanding in all other wilderness criteria and contains an unique combination of ecosystems within the refuge. This unit is an area where ecological processes should be allowed to operate as naturally as possible to provide a standard for comparison with future management and development in the adjacent areas.

Size. This unit meets the size criterion for designation as wilderness. It is approximately 1.4 million acres or 16 percent of the Yukon Flats Refuge.

Land Ownership. This unit is primarily in federal ownership. All inholdings are subject to valid existing rights, including the right to access under Title XI of ANILCA. No developments which would affect the wilderness qualities of the surrounding lands are anticipated on any of these inholdings.

Natural Integrity. The fish and wildlife populations and ecosystems found in this unit are generally unaffected by human activities. Subsistence and recreation activities, including hunting, fishing, trapping, and river floating, occur in this unit. These activities, though, have not affected the natural integrity of the area.

Apparent Naturalness. The unit is natural in appearance. Only limited development has occurred in the unit, related primarily to placer mining and subsistence activities. Little physical evidence of past activities that would be annoying to the wilderness user is present.

Outstanding Opportunities for Solitude. This unit is large and remote. Access to the unit is difficult, limited primarily to boat access via a few streams (primarily Beaver Creek) and float plane access on a small number of lakes in the lower areas of the unit. The number of gravel bars suitable for airplane landings is limited within the unit. Foot travel to the unit is difficult because of its remoteness and foot travel within the unit is difficult because of the steep, rugged terrain of the White Mountains. Except for possible encounters along Beaver Creek or other streams, a visitor to the White Mountains unit would be unlikely to meet other users of the area.

Outstanding Opportunities for Primitive Recreation. The White Mountains provide outstanding opportunities for primitive recreation. Challenge, isolation, and risk would be a part of any recreation experience in the White Mountains. Vistas from the peaks of the White Mountains make the visitor aware of just how primitive and remote this area is.

Special and Unique Features. The white limestone outcroppings which comprise the White Mountains are the most special and unique of the features that distinguish this unit from the others and from other areas of Alaska.

Conclusion - The White Mountains unit meets the wilderness criteria for size, ownership, natural integrity, apparent naturalness, solitude, and primitive recreation.

Hodzana River Unit. This unit encompasses that area of the refuge commonly referred to as the Hodzana Highlands. Within the unit are the entire watersheds of the Hodzana and Hadweenzic rivers. These rivers and others, including the Dall River, provide high quality water for fish which are an important item of the food web of the region. A resident population of Dolly Varden has been found on the main channel of the Hodzana above Caribou Bar.

Historically, the area has been a wintering area for the Western Arctic and Porcupine caribou herds. Bear, moose, and wolves are also found in the area. The ruggedness and remoteness from settlements of the unit have kept use of the area low. However, recent studies have shown that the unit is rich in archeological sites. Recent studies of mineral potential in the area indicated limited potential and little placer mining has occurred.

This unit provides an opportunity to preserve basically undisturbed watersheds and the diversity of ecosystems of which they consist, allowing for future study and research.

Size. This unit meets the size criterion. It is approximately 2.1 million acres or 25 percent of the refuge.

Land Ownership. Most of the unit is in federal ownership. All inholdings are subject to valid existing rights, including the right to access under Title XI of ANILCA. No developments which would affect the wilderness qualities of the surrounding lands are anticipated on any of these inholdings.

Natural Integrity. The fish and wildlife populations and ecosystems found in this unit have generally been unaffected by human activities. Subsistence and recreation activities, including hunting, fishing, trapping, and river floating, occur in this unit. These activities, though, have not affected the natural integrity of the area. Two virtually undisturbed watersheds, the Hodzana and Hadweenzic drainages, are located entirely within the unit.

Apparent Naturalness. The unit is natural in appearance. Only limited development has occurred in the unit, related primarily to subsistence activities. Little physical evidence of past activities that would be annoying to the wilderness user is present.

Outstanding Opportunities for Solitude. This unit is large and remote. Access into the area is difficult with access limited primarily to boats on the Dall, Hodzana, and Hadweenzic rivers. Opportunities for airplane landings within the unit are limited. Because of its remoteness and the steep terrain in the unit, overland travel (including on foot) to and within the unit is difficult. A visitor to the unit is unlikely to encounter other humans with the possible exception being along the major rivers in the unit.

Outstanding Opportunities for Primitive Recreation. The Hodzana Highlands provide outstanding opportunities for primitive recreation to those who travel to this area. Challenge, isolation, and risk are a part of any recreation experience that a person might undertake while visiting the unit.

Special and Unique Features. The watersheds of the Hodzana and Hadweenzic rivers are entirely within this unit, providing an opportunity to preserve basically undisturbed watersheds and the diversity of ecosystems of which they consist. This unit also contains a large number of archeological sites.

Conclusion. The Hodzana River unit meets all the wilderness criteria for size, land ownership, natural integrity, apparent naturalness, solitude, and primitive recreation opportunities.

Black River Unit. The Black and Little Black rivers both meander through the southeastern portion of the refuge. The lands are best described as rolling hills forested with spruce and hardwoods.

Throughout recorded history, the area has had a reputation for being rich in fur. This still holds true today. Though a difficult area to trap, it is worked by some of the best trappers in the region. These trappers consistently bring in quality fur. Local Natives in the region refer to this area as the "cradle of the lynx."

This area of the refuge is part of one of the wildest remaining regions in North America. When Soapy Smith's gang split up some of its members migrated here. Legend has it that the last known bushman (native outcast) lived in a cave somewhere in the region.

Size. This unit meets the size criterion for designation as wilderness. It is approximately 1.25 million acres or 15 percent of the Yukon Flats Refuge.

Land Ownership. Most of the unit is in federal ownership. All inholdings are subject to valid existing rights, including the right to access under Title XI of ANILCA. No developments which would affect the wilderness qualities of the surrounding lands are anticipated on any of these inholdings.

Natural Integrity. The fish and wildlife populations and ecosystems found in this unit have generally been unaffected by human activities. Subsistence activities, including hunting, fishing, and trapping, do occur. This use, though, has not affected the natural integrity of the area. The Black and Little Black rivers are primary routes of travel for local people.

Apparent Naturalness. The unit is natural in appearance. Only limited development has occurred in the unit, related primarily to subsistence activities. Little physical evidence of past activities that would be annoying to the wilderness user is present.

Outstanding Opportunities for Solitude. This unit is large and remote. Most travel is by motorboat on the Black and Little Black rivers. Although airplanes are not a common method of access into the area, a number of large lakes are located in the unit and could provide access for airplanes mounted with floats or skis. Wheeled airplane access is limited. Overland travel is restricted to winter when a few trappers utilize the area. A visitor to the unit is unlikely to encounter other humans with the possible exception being along the major rivers in the unit.

Outstanding Opportunities for Primitive Recreation. The Black River unit provides outstanding opportunities for primitive recreation to those who travel to this area. Challenge, isolation, and risk are a part of any recreation experience that a person might undertake while visiting the unit.

Special and Unique Features. The Black River country is probably the most productive lynx area in the State of Alaska. This area remains as some of the most remote and wild country of North America.

Conclusion. The Black River unit meets the wilderness criteria for size, ownership, natural integrity, apparent naturalness, solitude, and primitive recreation.

The Flats Unit. This lowland unit is split into three parts by large native ownerships within the refuge boundary. It is prime waterfowl habitat consisting of marshes, lakes, oxbows, sloughs, and streams. Both fire and flooding are important natural forces here. Fire provides rapid recycling of nutrients and flooding provides flushing and replenishment of nutrients from the flood waters.

This unit consists of one of the most unique wetland ecosystems in Alaska and is the largest of all interior Alaska basins. It is one of the most consistent and most outstanding waterfowl production areas in North America. In 1962, the breeding population of ducks on the Yukon Flats was estimated to be over one-half million, a number representing 1.6 percent of the continental waterfowl breeding population (USDI, 1964). Many wetland areas of Canada and the continental United States have since been drained, reducing breeding habitat and increasing the significance of the Yukon Flats for waterfowl breeding. Today, a long-term average (1975-1984) of about 1.6 million ducks is estimated to breed on the Yukon Flats annually. These resource have received and continue to receive serious threats. This area would have been flooded had the Rampart Canyon Dam been constructed. Similar lands within the refuge boundary contain high quality waterfowl habitat, but are now in private ownership and may be modified both by development and by protection from

fire. Lands remaining in federal ownership should be protected to allow ecological processes to operate naturally.

The Yukon Flats basin is the largest interior basin in Alaska. Its configuration and size create a unique solar basin unlike any other found at such extreme latitudes. Summer temperatures on the Yukon Flats are higher than at any other place of comparable latitude in North America. It is the only place in the world where temperatures of 100 degrees Fahrenheit have been recorded north of the Arctic Circle. The protective mountains surrounding the basin which make possible these high summer temperatures create a giant natural frost pocket in the basin where winter temperatures approach the coldest of any inhabited area in the world.

Size. This unit meets the size criterion. It is approximately 2.25 million acres or 27 percent of the Yukon Flats Refuge. Each of the individual subunits would also meet the size criterion.

Land Ownership. Most of this unit is in federal ownership, although large blocks of Native selected and conveyed lands surrounding the communities of Stevens Village, Beaver, Birch Creek, Fort Yukon, and Chalkyitsik result in the unit be divided into three subunits. In addition, a large number of Native allotments are located along the Yukon River and its major tributaries. All inholdings are subject to valid existing rights, including the right to access under Title XI of ANILCA. No developments which would affect the wilderness qualities of the surrounding lands are anticipated on any of these inholdings.

Natural Integrity. The fish and wildlife populations and ecosystems found in this unit have generally been unaffected by human activities. Subsistence and recreational activities, including hunting, fishing, trapping, and river floating, do occur in the unit. These uses, though, have not significantly affected the natural integrity of the area. The Yukon River and its major tributaries are the primary routes of travel for local people.

Apparent Naturalness. The unit is natural in appearance. Although numerous Native allotments are located in the unit, the cabins and other developments (primarily used for subsistence activities) on these allotments would not be particularly annoying to the wilderness user.

Outstanding Opportunities for Solitude. This unit is large and much of it is remote. Most travel occurs on the Yukon River and its major tributaries, either by motorboat, raft, or canoe. Float planes land on the river or larger lakes in the summer and ski planes land in the winter. Wheel planes may land on some gravel bars in the river also. Snowmobiles are common transportation in the winter with most use occurring on frozen rivers or on long used winter trails. Opportunities are plentiful for solitude over most of the area. A visitor to the unit would seldom encounter other humans except along the Yukon River and its major tributaries.

Outstanding Opportunities for Primitive Recreation. The Yukon River is a good river for floating. It provides good wildlife viewing and fishing. Sand bars for camping are plentiful. Venturing away from the main stream would take a visitor to areas rarely visited by others.

Special and Unique Features. This unit contains one of the most consistent and most outstanding waterfowl production areas in North America. Even when production is down in other areas as a result of drought or other phenomena, production on the Yukon Flats has remained high. In addition, numerous historic sites occur along the Yukon River which add to the importance and unique character of the unit.

Conclusion. The Flats unit meets all the wilderness criteria for size, land ownership, natural integrity, apparent naturalness, solitude, and primitive recreation opportunities.

Sheenjek/Porcupine Unit. The Porcupine River is one of the longest tributaries of the Yukon River. It is rich in history, particularly from the days of extensive fur trade. It extends for over 200 miles from its mouth near Fort Yukon to the U.S.-Canadian border and another 260 miles into the Yukon Territory, Canada. The portion of the river within the refuge consists of meandering water courses with numerous loops, bends, and channels flowing through a broad marshy flood plain containing numerous lakes, oxbows, and sloughs. It is heavily timbered around the lakes. Physiographically, this area is part of the Yukon Flats province. Except for some cabins on private lands along the banks of the river the region is primitive and undisturbed. Few people have penetrated this wilderness and even fewer have stayed long.

The Sheenjek River is a major tributary of the Porcupine. The river reaches 90 miles from its mouth to the refuge boundary and an additional 115 miles to its headwaters in the Brooks Range. The lower 70 miles lies in the Yukon Flats physiographic province. Here the river's elevation is between 500 and 700 feet. The flats are broad, forested alluvial plains, almost devoid of relief, containing numerous lakes, potholes, and oxbows. Extensive areas of swamp and muskeg are present. Fine stands of spruce, aspen, cottonwood, and birch grow throughout the area, especially along the stream courses and around lakes. There are no major sources of pollution and water quality is excellent.

Both the Porcupine and Sheenjek rivers are currently being studied for possible inclusion as wild rivers in the National Wild and Scenic River System. Current status is indicated in the Wild and Scenic Rivers section.

In many ways the Sheenjek/Porcupine unit is as primitive as it was when the first Europeans made contact here. The area ranks high in wilderness attributes. It is rich in history yet wild and untamed. Here the forces of nature have persisted as evidenced by the occurrence of fires and flooding and the diversity of wildlife.

Size. The unit meet the size criterion for designation as wilderness. It is approximately 1.45 million acres or 17 percent of the Yukon Flats Refuge.

Land Ownership. Most of this unit is in federal ownership. All inholdings are subject to valid existing rights, including the right to access under Title XI of ANILCA. No developments which would affect the wilderness qualities of the surrounding lands are anticipated on any of these inholdings.

Natural Integrity. The fish and wildlife populations and ecosystems found in this unit have generally been unaffected by human activities. Subsistence and recreational activities, including hunting, fishing, trapping, and river floating, do occur in the unit. These uses, though, have not significantly affected the natural integrity of the area. The Porcupine and Sheenjek rivers

are primary routes of travel for both local people and the limited number of recreationists using the area.

Apparent Naturalness. The unit is natural in appearance. Only limited development has occurred in the unit, related primarily to subsistence activities. Little physical evidence of past activities that would be annoying to the wilderness user is present.

Outstanding Opportunities for Solitude. This unit is large and remote. Most travel occurs by motorboat on the Porcupine and Sheenjek rivers. Float planes land on the larger lakes and rivers during the summer and ski planes are used occasionally in the winter. Wheeled aircraft can land on some gravelbars. Snowmobiles are common transportation in the winter with the majority of the use occurring on frozen stream courses or winter trails. Opportunities are plentiful for solitude over most of the area. A visitor to the unit would seldom encounter other humans except along the Porcupine and Sheenjek rivers.

Outstanding Opportunities for Primitive Recreation. The Porcupine and Sheenjek rivers are good rivers for floating. Sand and gravelbars for camping are plentiful. Those who are willing to venture away from the main rivers would soon be in areas rarely visited by others. Travel on foot is difficult under the best of conditions. Visitors would soon be aware of the challenge and risk that comes with traveling in this area.

Special and Unique Features. Both the Sheenjek and Porcupine rivers are special features of the unit. These rivers were identified in ANILCA for study as possible additions to the National Wild and Scenic Rivers System. (See Wild and Scenic River section of this chapter.)

Conclusion. The Porcupine/Sheenjek unit meets all the wilderness criteria for size, land ownership, natural integrity, apparent naturalness, solitude, and primitive recreation opportunities.

V. MANAGEMENT ALTERNATIVES

MANAGEMENT ALTERNATIVES

This chapter consists of three parts: a description of the management categories that make up each alternative; a description of the management directions common to all of the alternatives; and a description of the alternatives themselves. This chapter also presents the recommendations of the Service's wilderness review. These sections form the core of the final Yukon Flats Refuge Comprehensive Conservation Plan/Environmental Impact Statement/Wilderness Review.

MANAGEMENT CATEGORIES

According to ANILCA the comprehensive conservation plan for the Yukon Flats Refuge must:

(1) designate areas within the refuge according to their respective resources and values;
(2) specify the programs for conserving fish and wildlife and the programs relating to maintaining the special values of the refuge, proposed to be implemented within each such area; and
(3) specify the uses within each such area which may be compatible with the major purposes of the refuge.

Comprehensive planning must also comply with the National Environmental Policy Act (NEPA) which requires that reasonable alternatives be considered.

To develop management alternatives that meet the requirements of ANILCA, four management categories, ranging from intensive management to designated wilderness, were identified for the Yukon Flats Refuge. A management category is a set of refuge management directions applied to an area (in light of its resources and existing and potential uses) to facilitate management and accomplishment of refuge purposes. Table 13 shows what management activities, public uses, and economic uses would be permitted in each management category and under what conditions.

Management categories used in developing the management alternatives for the Yukon Flats Refuge are:

Intensive Management (I). This category is designed to accommodate economic development and a wide variety of resource management techniques while protecting refuge resources and values. Natural processes may be modified and the influence of human activities may be evident. Management practices allowed under this category include habitat improvement techniques (such as mechanical manipulation and water impoundments and diversions), construction of spawning channels and instream structures, and the construction of permanent fish weirs and hatcheries. Public use facilities, administrative sites, transmission lines, pipelines, and transportation systems may also be permitted. Oil and gas studies may be permitted subject to site-specific compatibility determinations. Oil and gas leasing may be permitted subject to an assessment of potential, a national interest determination, and a compatibility determination. Refuge lands managed under this category may be available for sand and gravel removal.

Moderate Management (II). This category encompasses undeveloped areas where habitat and public use are managed to provide varied benefits in a natural setting. Existing fish and wildlife populations will be maintained, although some development could occur. Management practices allowed under this category include habitat improvement techniques (such as mechanical manipulation and water impoundments and diversions), construction of spawning channels and instream structures, and the construction of permanent fish weirs and hatcheries. Visitor contact and educational facilities will not be provided although improved campsites and educational materials may be provided. All traditional motorized access and transportation and utility systems, as authorized in Title XI of ANILCA, would be permitted, but only unimproved roads would be allowed for other uses. Oil and gas studies, including seismic, may be permitted, subject to site-specific stipulations and mitigation measures. Oil and gas leasing may be permitted subject to an assessment of potential, a national interest determination, and a compatibility determination.

Minimal Management (III). This category is intended to maintain the pristine condition of those areas which have high fish and wildlife and wilderness values, but have not been designated as wilderness by Congress. Unlike designated wilderness, minimal management lands could be reclassified administratively by the Service if it is determined that such a change was necessary or desirable. Terrestrial habitat improvement would be permitted through prescribed burning (and minor habitat improvements such as nesting devices and beaver dam removal), although facilities and habitat modification will be allowed on a case-by-case basis for fisheries management. Subsistence, recreational uses, and motorized access for traditional activities (authorized in Title XI of ANILCA) would be allowed, but construction of public use and administrative facilities (except to ensure visitor safety or properly administer the refuge) and economic development (such as oil and gas leasing, sand and gravel extraction, and commercial timber harvest) are not permitted.

Wilderness Management (IV). Refuge lands can only be included in the wilderness system through formal designation by Congress. The designated wilderness category is similar to the minimal management category for permitted administrative and public uses. Once an area is designated as wilderness by Congress, certain activities are legislatively prohibited by the Wilderness Act as modified by ANILCA (i.e. oil and gas and other mineral leasing, surface disturbing activities, and the use of some types of motorized equipment). Only congressional action would allow such activities to occur in designated wilderness. The use of motorized equipment for oil and gas studies would be permitted in designated wilderness, but only if these studies are conducted by or for a Department of the Interior agency as provided for in Section 1010 of ANILCA. Transportation or utility system route proposals would require Presidential concurrence and Congressional approval. New permanent facilities will not be permitted in designated wilderness for fishery management purposes unless they are essential to accomplish refuge management objectives. Terrestrial habitats could be manipulated through prescribed burning only.

MANAGEMENT OF THE BEAVER CREEK NATIONAL WILD RIVER CORRIDOR

Beaver Creek (from its headwaters to approximately sixteen river miles inside the refuge boundary) was designated as a component of the National Wild

Table 13. Public uses and facilities, economic uses, access, and resource management activities compatible with management policies in each category.

HABITAT/POPULATION MANAGEMENT ACTIVITIES	Intensive Management (I)	Moderate Management (II)	Minimal Management (III)	Wilderness Management (IV)
Research and Management Studies Collection of data necessary for refuge management decisions or to further science. Priority will be given to studies that contribute to the conservation and management of native fish and wildlife populations and their habitats. Studies may be conducted by the Service or by other researchers under Service guidance and/or consent.	Will be routinely practiced provided the studies do not conflict with refuge purposes	Same as (I)	Same as (I)	Same as (I)
Ecological Monitoring Activities or studies that address how fish and wildlife and their habitats are changing, due to either natural or human causes.	Will be routinely practiced	Same as (I)	Same as (I)	Same as (I)
Fish and Wildlife Inventories Using acceptable management techniques to obtain information on species distributions, habitats, and population dynamics to meet refuge objectives.	Will be routinely practiced	Same as (I)	Same as (I)	Same as (I)
Marking and Banding To contribute information on population trends, survival, and movements necessary for the overall management of the species. Cooperation with ADF&G and other institutions will be stressed.	Will be routinely practiced as long as the activities do not conflict with refuge purposes	Same as (I)	Same as (I)	Same as (I)
ıbitat Improvement Mechanical manipulation including activities such as large scale tree crushing, water impoundments, diversions, etc.	May be permitted on a case-by-case basis subject to provisions of NEPA and a compatibility determination	Same as (I)	May be considered subject to appropriate plan revision	Not permitted
Prescribed burning.	May be permitted on a case-by-case basis subject to provision of NEPA, a compatibility determination, and an approved fire management plan	Same as (I)	Same as (I)	Same as (I)
Minor habitat improvements including nesting devices, temporary actions to protect habitat, beaver dam removal, etc.	May be permitted subject to provisions of NEPA and a compatibility determination	Same as (I)	Same as (I)	Same as (I), subject to the minimal tool concept
Timber Management Way of maintaining a sustained yield for long-range subsistence needs, for house logs and firewood. May entail designation of areas for cutting and the issue of special use permits.	May be permitted, subject to reasonable regulations	Same as (I)	Same as (I)	Same as (I)
Exotic Wildlife Species Introduction Introduction of species not native to North America.	Not permitted	Same as (I)	Same as (I)	Same as (I)
Native Wildlife Species Introduction Introduction of species native to North America outside their original range.	May be permitted on a case-by-case basis	Same as (I)	Same as (I)	Same as (I)
Wildlife Stocking Re-establishing, augmenting, or maintaining native species within their original breeding range. Specific policies ɹpply for various wildlife groups.	May be permitted	Same as (I)	Same as (I)	Same as (I)

- A site-specific compatibility determination will be required for all activities or uses requiring special use permits.
- If management emergencies occur on the refuge, it may be necessary to allow actions which would otherwise be prohibited.
- Management of activities occurring on navigable waters will be coordinated with appropriate State agencies.

Table 13. Public uses and facilities, economic uses, access, and resource management activities compatible with management policies in each category (continued).

	Intensive Management (I)	Moderate Management (II)	Minimal Management (III)	Wilderness Management (IV)
HABITAT/POPULATION MANAGEMENT ACTIVITIES				
Predator Control Relocation or removal of predators to favor other wildlife populations or to protect reintroduced, threatened, or endangered species.	May be permitted on a case-by-case basis subject to the provisions of NEPA and a compatibility determination	Same as (I)	Same as (I)	Same as (I)
Pest Control Relocation or removal of organisms that threaten human health and property or survival of native fish and wildlife species.	Normally will not occur except to control exotic species; native species may be controlled where severe resource damage is likely or where public health or safety is jeopardized	Same as (I)	Same as (I)	Same as (I)
Disease Prevention and Control Management practices directed at controlling pathogens that threaten fish, wildlife, and people. Includes rabies and parasite control.	Normally will not occur except where severe resource damage is likely or where public health and safety is jeopardized.	Same as (I)	Same as (I)	Same as (I)
Fire Management Prescribed burning and actions taken to suppress wild fires, in accordance with the refuge's fire management plan.	Natural fires may be permitted to burn, except where they threaten human life and property or reach excessive size; prescribed burning will be used for hazardous fuel reduction or restoration of natural vegetation patterns	Same as (I)	Same as (I)	Same as (I)
Water Quality and Quantity Monitoring of water quality and quantity to enable the Service to propose mitigation of adverse effects that originate on or off the refuge.	Will be routinely practiced	Same as (I)	Same as (I)	Same as (I)
Administrative Facilities Structures built for adminstrative use primarily to facilitate field work logistics. Available for emergency use by the public.	Permitted	Same a (I)	Same as (I)	May be built if needed for the protection of public health and safety
FISHERIES DEVELOPMENT Collection of data and information on fish populations and their habitats, modification of fish habitat, fish hatchery programs and related activities, fishery regulation, supplemental production, and other activities designed to accomplish management goals and objectives.				
Fish Passes Construction or installation of a fish ladder, removal of a barrier (e.g., beaver dam), or other activity to enable fish to get past a natural or man-made barrier and reach unaccessible habitat; may be either permanent or temporary.	May be permitted on a case-by-case basis subject to the provisions of NEPA and a compatibility determination	Same as (I)	Same as (I)	Same as (I) except permanent facilities will normally not be permitted
Fish Weirs Construction and installation of instream fish counting facility; may be permanent or temporary. Permanent weirs have permanent instream anchoring devices while temporary weirs do not. Above water structure for both types of weirs would be removed after the season of use.	May be permitted on a case-by-case basis subject to provisions of NEPA and a compatibility determination	Same as (I)	Same as (I)	Same as (I) except permanent facilities will normally not be permitted

- A site-specific compatibility determination will be required for all activities or uses requiring special use permits.
- If management emergencies occur on the refuge, it may be necessary to allow actions which would otherwise be prohibited.
- Management of activities occurring on navigable waters will be coordinated with appropriate State agencies.

Table 13. Public uses and facilities, economic uses, access, and resource management activities compatible with management policies in each category (continued).

HABITAT/POPULATION MANAGEMENT ACTIVITIES	Intensive Management (I)	Moderate Management (II)	Minimal Management (III)	Wilderness Management (IV)
Spawning Channels Construction and maintenance of an artificial gravel laden channel where water quality and quantity is controlled to facilitate spawning by fish.	May be permitted on a case-by-case basis subject to provisions of NEPA and a compatibility determination	Same as (I)	Same as (I)	Same as (I) except permanent facilities will normally not be permitted
Physical Habitat Modifications Activities designed to physically modify aquatic habitats, for the purpose of affecting production of a target fish species, such as bank stabilization or installation of instream structures. May be temporary or permanent.	May be permitted on a case-by-case basis subject to provisions of NEPA and a compatibility determination	Same as (I)	Same as (I)	Same as (I) except permanent facilities will normally not be permitted
Chemical Habitat Modifications Introduction of either organic or inorganic chemicals on an annual or temporary basis to an aquatic environment to control the production of a target fish species.	May be permitted on a case-by-case basis subject to provisions of NEPA and a compatibility determination	Same as (I)	Same as (I)	Same as (I) except permanent facilities will normally not be permitted
Native Fish Reintroductions Reintroduction of native species for the purpose of re-establishing historic populations.	May be permitted	Same as (I)	Same as (I)	Same as (I)
Native Fish Introductions Introduction of fish species native to North America outside their original range.	May be permitted on a case-by-case basis	Same as (I)	Same as (I)	Same as (I).
Exotic Fish Introductions Introduction of non-native fish species on the refuge.	Not permitted	Same as (I)	Same as (I)	Same as (I)
Fish Rearing Ponds Use of natural ponds for rearing fry or fingerling fish to a larger size.	May be permitted on a case-by-case basis subject to provisions of NEPA and a compatibility determination	Same as (I)	Same as (I)	Same as (I)
Fish Hatcheries Construction and operation of required facilities for incubation of fish eggs and/or rearing of fish fry, fingerlings, or smolt; either permanent or temporary. A permanent hatchery could be operated seasonally or year-round; would be permanently maintained. Temporary hatchery would be operated seasonally; is project related (removed at project completion).	May be permitted on a case-by-case basis subject to provisions of NEPA and a compatibility determination	Same as (I)	Same as (I)	Same as (I) except permanent facilities will normally not be permitted
Supplemental Fish Production Planting fertilized or eyed eggs, fed or unfed fry, fingerlings, presmolts, or smolts, which have been incubated, hatched, fed, and/or reared at a hatchery or temporary rearing facility and are subsequently introduced into the species' natural environment.	May be permitted on a case-by-case basis subject to provisions of NEPA and a compatibility determination	Same as (I)	Same as (I)	Same as (I)

- A site-specific compatibility determination will be required for all activities or uses requiring special use permits.
- If management emergencies occur on the refuge, it may be necessary to allow actions which would otherwise be prohibited. Management of activities occurring on navigable waters will be coordinated with appropriate State agencies.

Table 13. Public uses and facilities, economic uses, access, and resource management activities compatible with management policies in each category (continued).

	Intensive Management (I)	Moderate Management (II)	Minimal Management (III)	Wilderness Management (IV)
HABITAT/POPULATION MANAGEMENT ACTIVITIES				
Fish Egg Taking Site Installation and operation of a temporary facility that uses adult spawning fish to take eggs for the establishment of a brook stock or for use in supplemental production. Both facilities and activities would be on an "as needed" basis.	May be permitted on a case-by-case basis subject to provisions of NEPA and a compatibility determination	Same as (I)	Same as (I)	Same as (I)
Predator/Competitor Control Removing or reducing predators and/or competitor fish species for the purpose of controlling the production of a target fish species.	May be permitted on a case-by-case basis subject to provisions of NEPA and a compatibility determination	Same as (I)	Same as (I)	Same as (I)
SUBSISTENCE ACTIVITIES				
Fishing, Hunting, Trapping, Berry Picking The taking of fish, wildlife, and other natural resources for personal consumption or as provided by law. Allows use of traditionally used camping areas.	Permitted subject to reasonable regulations	Same as (I)	Same as (I)	Same as (I)
House Log and Firewood Collection Collection for personal or extended family use.	Permitted subject to reasonable regulations	Same as (I)	Same as (I)	Same as (I)
Cabins Small, primitive structures necessary for health and safety and necessary to provide for continuation of ongoing subsistence activity; not for recreational use.	May be permitted subject to special use permit	Same as (I)	Same as (I)	Same as (I)
Access Use of snowmobiles, motorboats, and other means of surface transportation traditionally employed for subsistence purposes.	Permitted subject to reasonable regulation and the provisions of Section 811 of ANILCA	Same as (I)	Same as (I)	Same as (I)
ACCESS (restrictions subject to the provisions of Title XI of ANILCA)				
Nonmotorized Access by foot, dogsled, kayaks, rafts, etc., on waterways, trails, and cross-country.	Permitted; access may be restricted at certain times for resource protection or public safety	Same as (I)	Same as (I)	Same as (I)
Pack Animals Surface transportation using domestic horses, dogs, and other pack or saddle animals.	Permitted for traditional activities, subject to reasonable regulation (50 CFR 36.21b)	Same as (I)	Same as (I)	Same as (I)
Motorboats Includes in-board and out-board powerboats and jet boats that provide access to the refuge. Excludes air boats and air-cushion boats.	Permitted for traditional activities, subject to reasonable regulation	Same as (I)	Same as (I)	Same as (I)
Airplanes Includes all fixed-wing planes that provide access to the refuge.	Permitted for traditional activities, subject to reasonable regulation	Same as (I)	Same as (I)	Same as (I)

- A site-specific compatibility determination will be required for all activities or uses requiring special use permi
- If management emergencies occur on the refuge, it may be necessary to allow actions which would otherwise be prohibi
- Management of activities occurring on navigable waters will be coordinated with appropriate State agencies.

Table 13. Public uses and facilities, economic uses, access, and resource management activities compatible with management policies in each category (continued).

	Intensive Management (I)	Moderate Management (II)	Minimal Management (III)	Wilderness Management (IV)
ACCESS (subject to Title XI of ANILCA)				
Helicopters All rotary-wing aircraft that provide access to the refuge	May be permitted, but only by special use permit	Same as (I)	Same as (I)	Same as (I)
Snowmobiles All snowmachines weighing under 1,000 pounds and with an overall width of less than 46 inches driven by tracks and steered by a ski or skis in contact with the snow.	Permitted for traditional activities, on or off designated trails, in periods of adequate snow cover, subject to reasonable regulation	Same as (I)	Same as (I)	Same as (I)
Other Motorized Vehicles Includes all other motorized vehicles (e.g., cars, 4x4's, tracked vehicles, off-road vehicles, air boats, and air-cushion boats).	Permitted only on designated routes or areas; airboats and air-cushion vehicles not permitted	Same as (I)	Same as (I)	Not permitted
RECREATIONAL USES				
Hunting, Fishing, and Trapping Forms of outdoor recreation and fish and wildlife population control.	Permitted; pertinent state/federal regulations apply	Same as (I)	Same as (I)	Same as (I)
Primitive Camping Sites selected by users to pitch tents overnight. Service will not maintain or improve these sites.	Permitted	Same as (I)	Same as (I)	Same as (I)
ıterpretation and Environmental Education To broaden public awareness and appreciation of fish and wildlife resources and their habitats, cultural resources, and scientific resource management practices. To inspire visitors to further their own comprehension of wildlife habitat and resource issues as they relate to society's needs and to foster wildlife and wildland stewardship.	Interpretive facilities and materials may be provided, including posted nature trails, wildlife/wildland related signs, visitor facilities, and wildlife displays	Interpretive materials may be provided; other facilities not provided	Same as (II)	Same as (II)
Wildlife Observation Wildlife, habitat, and landscape features viewed in their natural setting. Includes photography and bird watching.	Permitted	Same as (I)	Same as (I)	Same as (I)
PUBLIC FACILITIES (restrictions subject to the provisions of Title XI of ANILCA)				
Visitor Contact Facilities A variety of staffed or unstaffed structures where the public can obtain information on the refuge and its resources.	May be provided	Not provided	Same as (II)	Same as (II)
Improved Campsites Permanent sites that may include fire rings, shelters, and sanitary facilities.	May be provided if needed to confine resource degradation	Same as (I)	Same as (I)	Same as (I)
Other Temporary Facilities Establishment and use of tent platforms, shelters, and other temporary facilities and equipment directly related to the taking of fish and wildlife.	May be permitted subject to reasonable regulations, under provisions of Section 1316 of ANILCA; tent platforms require a Special Use Permit	Same as (I)	Same as (I)	Same as (I)

- A site-specific compatibility determination will be required for all activities or uses requiring special use permits.
- If management emergencies occur on the refuge, it may be necessary to allow actions which would otherwise be prohibited.
- Management of activities occurring on navigable waters will be coordinated with appropriate State agencies.

Table 13. Public uses and facilities, economic uses, access, and resource management activities compatible with management policies in each category (continued).

	Intensive Management (I)	Moderate Management (II)	Minimal Management (III)	Wilderness Management (IV)
PUBLIC FACILITIES (subject to Title XI of ANILCA)				
Boat Launch Sites Designated access sites where boats can be put into lakes and rivers. May vary from simple clearings to permanent ramps.	May be permitted	Same as (I)	Not permitted	Same as (III)
Foot Trails Designated routes restricted to walking. Not cleared or maintained.	May be provided	Same as (I)	Same as (I)	Same as (I)
All-weather Roads Designated, maintained corridors that provide access for motorized vehicles. Includes asphalt roads, gravel roads, and other maintained roads. May include signs, bridges, pull-outs, waysides, etc.	May be permitted	Not permitted	Same as (II)	Same as (II)
Unimproved Roads Vehicular corridors that are not maintained or receive only limited maintenence including temporary roads required for oil and gas development. Includes 4-wheel drive and utility access trails.	May be permitted	Same as (I)	Not permitted	Same as (III)
Air Strips Designated sites that provide access for aircraft. Includes cleared strips, asphalt and concrete strips.	Primitive airstrips may be designated; no new construction allowed	Same as (I)	Same as (I)	Same as (I)
Navigation Aids/Remote Weather Stations Includes air and water navigation aids, facilities for national defense, and facilities for weather, climate, and fisheries research and monitoring.	Permitted on a site-specific basis subject to reasonable regulation	Same as (I)	Same as (I)	Same as (I)
ECONOMIC USES				
Surface Geology Studies Includes surface rock collecting and geologic mapping activities (includes helicopter or fixed-wing access).	May be permitted subject to refuge special use permit conditions	Same as (I)	Same as (I)	Same as (I)
Core Sampling Extraction of subsurface rock samples with small, portable (usually helicopter transported) drill rigs. Does not include exploratory drilling for oil and gas.	May be permitted subject to refuge special use permit conditions	Same as (I)	Same as (I)	Not permitted[1]
Seismic (Geophysical) Studies Examination of subsurface rock formations through devices that set off and record vibrations in the earth. Usually involves mechanized surface transportation, but may be helicopter supported.	May be permitted subject to refuge special use permit conditions	Same as (I)	Same as (I)	Not permitted[1]
Other Geophysical Studies Helicopter supported gravity and magnetic surveys (other minimal impact activities that do not require mechanized surface transportation).	May be permitted subject to refuge special use permit conditions	Same as (I)	Same as (I)	Same as (I)

[1] Section 1010 of ANILCA allows these activities in wilderness areas when conducted by agencies within the Department of the Interior or their contractors for the purpose of assessing the mineral potential of federal lands.

- A site-specific compatibility determination will be required for all activities or uses requiring special use permits.
- If management emergencies occur on the refuge, it may be necessary to allow actions which would otherwise be prohibited.
- Management of activities occurring on navigable waters will be coordinated with appropriate State agencies.

Table 13. Public uses and facilities, economic uses, access, and resource management activities compatible with management policies in each category (continued).

ECONOMIC USES	Intensive Management (I)	Moderate Management (II)	Minimal Management (III)	Wilderness Management (IV)
Oil and Gas Leasing Drilling and extraction of oil and gas for commercial purposes. Includes all associated above and below ground facilities.	May be permitted subject to assessment of potential, national interest determination, and a compatibility determination	Same as (I)	Not permitted	Same as (III)
Sand and Gravel Removal Extraction of sand and gravel for commercial purposes.	May be permitted	Not permitted	Same as (II)	Same as (II)
Other Mineral Leasing Includes the extraction of coal, pumice, pumicite, cinders, clay, potassium, sodium, phosphate, sulfur, or other minerals for commercial purposes.	Not permitted	Same as (I)	Same as (I)	Same as (I)
Hydroelectric Power Development[2] Includes full commercial development of a site (a dam, impoundment area, penstock, powerhouse, tailrace, and other associated facilities).	Not permitted	Same as (I)	Same as (I)	Same as (I)
Transmission Lines/Pipelines Includes telephone and electrical power lines, oil and gas pipelines, and other related facilities. Does not include facilities associated with on-refuge oil and gas development.	May be permitted on a site-specific basis subject to restrictions on road access and methods of transmission/pipeline placement and subject to Title XI of ANILCA	Not permitted, subject to provisions of Title XI of ANILCA	Same as (II)	Same as (II)
Commercial Guiding Licensed big game guides, outfitters, sport fishing guides, river guides, air-taxi operators and all other commercial operators that provide services to recreationists on the refuge. Includes all activities of the operator and facilities used by the operator on the refuge.	Permitted on a site-specific basis subject to reasonable regulations (e.g., duration of trips, timing, party size)	Same as (I)	Same as (I)	Same as (I)
Commercial Timber Harvest Removal of timber from the refuge for commercial purposes, including as house logs or firewood.	May be permitted on a site-specific basis subject to reasonable regulation	Same as (I)	Not permitted	Same as (III)
Grazing Grazing of domestic or wild animals, including reindeer, for commercial purposes.	Not permitted	Same as (I)	Same as (I)	Same as (I)
Agriculture Growing of agricultural crops for commercial purposes.	May be permitted on a case-by-case basis if compatible with refuge purposes	Not permitted	Same as (II)	Same as (II)
Commercial Fishing (Onshore Facilities) Includes all land-based sites, activities, and facilities on the refuge (e.g., campsites, cabins, motorized vehicles, landing strips).	May be permitted subject to reasonable regulations in accordance with provisions of ANILCA	Same as (I)	Same as (I)	Same as (I)

[2] Minor impacts associated with hydroelectric facilities constructed off-refuge may be allowed based on a site-specific evaluation.

A site-specific compatibility determination will be required for all activities or uses requiring special use permits.
If management emergencies occur on the refuge, it may be necessary to allow actions which would otherwise be prohibited.
- Management of activities occurring on navigable waters will be coordinated with appropriate State agencies.

and Scenic River System by ANILCA (Section 603(45)). A river management plan has been prepared for Beaver Creek which defines the river corridor and provides specific management directions for lands within the corridor (USDI-BLM & FWS, 1983). Management direction is similar to that under the minimal management category.

MANAGEMENT OF SELECTED LANDS

Over 900,000 acres of the lands selected by Native village and regional corporations have not yet been conveyed to private ownership. Much of this land will eventually be conveyed to Native ownership, although some lands may be returned to the refuge. The Service retains management responsibility of these lands, although the appropriate Native corporation is consulted prior to management actions being permitted. Management directions for these lands would be the same as on adjacent refuge lands.

MANAGEMENT DIRECTIONS COMMON TO ALL ALTERNATIVES

Management of the refuge is governed by federal laws (such as the National Wildlife Refuge Administration Act and ANILCA), by implementing regulations and service policy, and by the principles of sound resource management. Under all alternatives considered, management of the Yukon Flats Refuge complies with these factors. All alternatives also address the issues raised in public meetings and the significant problems identified by the refuge staff and planning team. Therefore, all alternatives share some common management directions. These directions provide a common management base on which each of the alternatives is built and represents the minimum level of resource management permissible under any of the alternatives.

MANAGEMENT EMERGENCIES

It may be necessary, when management emergencies occur on the refuge, to supersede certain of the management directions which are discussed in this section of the plan. Activities permitted within each management category (as shown in Table 13) may not be adhered to when emergencies occur. For example, if naturally occurring or man-caused actions (e.g., landslides, floods, fires, drought) are adversely affecting refuge resources, it may be necessary to undertake mechanical habitat manipulation, water management activities, fisheries enhancement practices, or other activities which would not otherwise be permitted on all or portions of the refuge.

MITIGATION

The use of mitigation measures to reduce or eliminate potential adverse impacts resulting from the implementation of the Yukon Flats Refuge CCP will be applied as standard practice whenever and wherever possible, relative to the goals and objectives of the plan being implemented. The Service will promulgate regulations, develop stipulations, and issue permits to mitigate other impacts. These regulations, stipulations, and permits will mitigate impacts by a variety of means: avoiding the impact altogether through time

and location restrictions; minimizing the impact by limiting the degree or magnitude of the action; rehabilitating or restoring the affected environment; and compensating for the impact by replacing or providing substitute resources or environments. Mitigation may consist of standard stipulations, such as those attached to oil and gas leases; special stipulations which may be attached to various types of leases or permits on a site-specific basis; and site-specific, project-specific mitigation identified through detailed step-down management plans or the environmental assessment process. The degree, type, and extent of mitigation undertaken will depend on the site-specific conditions present and the management goals and objectives of the action being implemented.

COOPERATION AND COORDINATION WITH OTHER GOVERNMENT AGENCIES

The Service will continue to coordinate refuge planning for the Yukon Flats Refuge with the Bureau of Land Management's Fairbanks District, with respect to the White Mountains National Recreation Area, the Steese National Conservation Area, and other adjacent BLM-administered lands, and with local, state, and other federal agencies whose programs affect or are affected by the Yukon Flats Refuge. Interagency cooperation increases the management effectiveness needed to accomplish refuge purposes and to meet mutual management needs. Examples of areas where cooperative efforts have been or may in the future be undertaken include: fire management, water quality management, fish and wildlife management, law enforcement, search and rescue, management of navigable waters, identification and preservation of cultural resources, and management of access to and across the refuge (easements). Whenever possible, the Service will share equipment and aircraft costs, conduct joint wildlife surveys, exchange data, and conduct research to meet mutual management needs. The Service will cooperate with regional and local advisory councils to provide resource information and in resolving user conflicts.

The Fish and Wildlife Service and the State of Alaska will cooperatively manage the fish and wildlife resources of the Yukon Flats Refuge. A memorandum of understanding between the Fish and Wildlife Service and Alaska Department of Fish and Game (ADF&G) (see Appendix H) defines the cooperative management roles of each agency. Department of the Interior, Fish and Wildlife Policy: State and Federal Relationships (43 CFR 24) further addresses intergovernmental cooperation in the protection, use, and management of fish and wildlife resources. The closely related responsibilities of protecting habitat and fish and wildlife populations and providing for fish and wildlife utilization require close cooperation of the ADF&G, the FWS, and all resource users.

The Service will work cooperatively with the State of Alaska and other adjacent landowners to identify all rights-of-way claims pursuant to Revised Statute (RS) 2477 within the Yukon Flats Refuge for administrative purposes only. The validity of any claims can only be determined in a court of competent jurisdiction. For a list and map of possible RS 2477 rights-of-way on the Yukon Flats Refuge see Appendix J.

COOPERATION WITH INHOLDERS AND OWNERS OF ADJACENT LANDS

The Service will maintain a spirit of cooperation and good will with its neighbors and the public under all alternatives. The Service will foster this relationship by keeping the public informed of refuge management policies and activities; by periodically consulting with landowners, communities, special

interest groups, and other constituents who have expressed an interest in, or are affected by, refuge programs; and by being responsive to conflicts that arise over refuge programs.

The Service expects to cooperate with owners of land within, adjacent to, or near the refuge, and will consider cooperative agreements, if they would help achieve refuge management purposes. To ensure mutual benefit, the Service may provide technical and management assistance as set forth in Section 304(f) of ANILCA in exchange for an agreement from the landowner that they will manage the land in a manner compatible with refuge purposes, will permit the Service reasonable access to refuge lands, and will provide such other public benefit as may be agreed to.

Similarly, the Service may enter into agreements pursuant to the Alaska Land Bank Program as established by Section 907 of ANILCA. The objective of the program is "to enhance the quantity and quality of Alaska's renewable resources and facilitate the coordinated management and protection of Federal, State, and Native and other private lands." Under these agreements the private landowner agrees to manage the subject lands in a manner compatible with the management plan for the adjacent refuge, to permit reasonable access by federal agency personnel, not to alienate, transfer, assign, mortgage, or pledge the subject lands, and to develop or improve subject lands only as allowed in the agreement. The benefits to the landowner include immunity from: adverse possession; real property taxes; and judgments to recover debts incurred by the owner. In addition, the Service may provide technical and other assistance to the owner with respect to management of subject lands. Lands subject to land bank agreements do not become refuge lands. Ownership and management responsibility remain with the private landowner.

ACCESS TO INHOLDINGS

The use of snowmachines, boats, airplanes, and non-motorized surface transportation methods for traditional activities and for travel to and from communities and homesites is allowed on the refuge. In addition, State and private interests with valid surface and/or subsurface ownership or occupancy rights on or adjacent to the refuge are assured adequate and feasible access for economic and other purposes in accordance with Section 1110 of ANILCA. Such access will be subject to reasonable regulations that protect refuge resources and public health and safety.

LAND EXCHANGES AND ACQUISITION

Under section 1302 of ANILCA, the Secretary of the Interior is given the authority to acquire by purchase, donation, exchange, or otherwise any lands within the boundaries of any conservation system unit (such as national wildlife refuges).

The Service may exchange lands if these exchanges would benefit fish and wildlife resources, satisfy other purposes for which the refuge was established, or are necessary to satisfy other national interests. The Service will discuss with any concerned parties, the resource values, management needs and requirements, potential impacts, and the feasibility of any potential exchanges.

The Service will consider land exchanges and cooperative agreements with willing parties and for the purposes of protecting fish and wildlife and their habitats, to facilitate management, or for other purposes. Only the minimum amount of land necessary to reach management objectives will be sought,

although larger areas will be considered during negotiations. Care will be taken to minimize the impact on all parties concerned. Other exchanges which are for non-refuge public purposes or are for the benefit of the landowner will also be considered.

RESOURCE MANAGEMENT

Data collection and research. Additional refuge resource information is essential for developing an accurate baseline from which to set management objectives, determine trends, evaluate management effectiveness, identify existing and potential problems, and generally meet the needs of refuge management. Thus, under all alternatives, the Service will undertake studies and research necessary to improve the refuge data base.

Data collection and research will focus first on fish and wildlife populations that are of high management concern or that can function as indicators of overall ecological conditions.

The Service will closely monitor uses that may adversely impact fish and wildlife populations, such as recreational and subsistence hunting, oil and gas exploration and development activities, subsistence and sport fishing, and placer mining activities. The Service will gather and analyze data on recreation use, cultural resources, water resources, and other resource uses and management activities which may be affecting resources on the refuge.

Section 812 of ANILCA directs the Service to undertake research on subsistence uses of the refuge. Issues raised through the state fish and game advisory system or identified by the Service will be the focus of these studies. The Service will conduct the research in cooperation with other federal agencies and ADF&G. The Service will consult with local residents engaged in subsistence uses and provide research results to the state, local advisory committees, regional councils, and other interested parties.

The Service will encourage other researchers to study the refuge and will participate in cooperative studies with other organizations, such as ADF&G. Cooperative agreements with the State and with Native organizations, authorized by Section 809 of ANILCA, may be particularly useful for subsistence research.

Wildlife Management. It is the intent of the Service to maintain wildlife populations on the Yukon Flats Refuge at levels near the carrying capacity of refuge habitats, subject to naturally occurring fluctuations in populations. The Service will focus its efforts on maintaining existing fish and wildlife populations and productive habitats on the refuge, ensuring that the full complement of native flora and fauna continue to exist on the refuge. Introduction of exotic species (species not native to North America) will not be permitted, although introduction of native species (species native to North America outside their original range) and wildlife stocking (re-establishing, augmenting, or maintaining native species within their original breeding range) will be permitted.

Habitat improvement techniques will be permitted on the refuge, but only after a thorough evaluation process has been completed. Prescribed burning, simulating naturally-occurring fire processes, and minor habitat improvements (such as use of nesting devices and removal of beaver dams) will be permitted on a site-specific basis refuge-wide. Other habitat improvement techniques, such as mechanical manipulation and water impoundments and diversions, would be permitted on a site-specific basis in areas of the refuge designated for intensive and moderate management. No intensive or moderate management areas are proposed in the preferred alternative. Habitat improvement would be

undertaken only to maintain or increase the overall diversity of the refuge. Improvement activities could result in increased populations of some wildlife species.

Habitats of specific importance to individual species (e.g., calving grounds, nesting areas) or sensitive to disturbance (e.g., wetlands, riparian habitat) will be protected under all alternatives. These areas are critical habitats; often support large numbers of species; are fragile; and, if disturbed, are not easily reestablished. The Service will take particular care to minimize disturbance of these areas or will avoid these areas entirely.

The American peregrine falcon, an endangered species, is found on the refuge. The Peregrine Falcon Recovery Plan recommends restricting activities around peregrine falcon nest sites as protective measures for the peregrine. Within one mile of nest sites, restrictions include: requiring aircraft to maintain minimum altitudes of 1,500 feet above nest level from April 15 through August 31; prohibiting all ground level activity from April 15 through August 31 except on existing thoroughfares; and prohibiting habitat alterations or the construction of permanent facilities. Within two miles of nest sites, restrictions include: prohibiting activities having high noise levels from April 15 through August 31 and prohibiting permanent facilities having high noise levels, sustained human activity, or altering limited, high quality habitat (e.g., ponds, lakes, wetlands, and riparian habitat). Within 15 miles of nest sites, restrictions include: prohibiting alteration of limited, high quality habitat which could detrimentally and significantly reduce prey availability and prohibiting use of pesticides. These recommendations will be followed regardless of the alternative implemented.

Predator control may be allowed on refuge lands, provided it can be biologically justified. If data support the need for reducing predator population levels, a proposal for predator control must be accompanied by an environmental assessment in accordance with NEPA guidelines. The proposal and assessment must be made available to the public for review and comment. The assessment will determine whether or not the full environmental impact statement process, as defined by NEPA, is needed.

Research on the various wildlife species and associated habitats will continue. Knowledge gained from the studies will increase management efficiency in improving habitats and producing healthy wildlife populations, will enhance management of habitats for sustained yield, and will provide additional knowledge on the compatibility of human uses with the habitat needs of wildlife.

The Service will fulfill legal mandates and treaty responsibilities regarding endangered species and migratory birds. The Service will give special attention to maintaining the refuge's waterfowl population. The Service will also cooperate with and assist ADF&G in management of resident wildlife populations, particularly moose, brown bear, lynx, and Dall sheep, on the refuge and adjacent areas.

National Resource Species - As part of its regional resource planning process the Service has identified species that are of sufficient importance or concern nationally and in Alaska to merit special attention. Thirteen national resource species (see the Wildlife Section of the Affected Environment chapter) occur on the Yukon Flats Refuge. The Service has developed general management strategies for each species in its Alaska Regional Resource Plan. The strategies relevant for refuges, such as collecting survey data, monitoring populations, and protecting habitats, are reflected in the management directions developed for this plan. Other species of high public interest (e.g., moose, wolves, grizzly bears) will also receive management attention.

Fishery Management. Although ultimately responsible for the protection of fishery resources on refuge lands, the Service's cooperative agreement with ADF&G (Appendix H) and the Department of the Interior policy on state-federal relationships (43 CFR 24) vest primary authority for management of fish populations with ADF&G. Thus, the harvest of refuge fish populations will continue to be regulated by the state. The Service will cooperate with and assist ADF&G in the management of fish populations on the refuge and adjacent areas. The Service will also review ADF&G fish management projects to ensure that the refuge fishery is maintained. All fisheries work on the refuge will be coordinated between the refuge manager, the Service's Fisheries Resources Field Office in Fairbanks, and ADF&G.

The Service will protect spawning areas and water quantity and quality to ensure the maintenance of fish populations with the preservation of wild stocks in their natural unenhanced state being the first priority. As noted in the Service's Refuge Manual (6 RM 8.8(H)), for wilderness lands in Alaska, maintaining, enhancing, and rehabilitating existing fish populations is permitted, where compatible with the purposes of the refuge. In designated wilderness areas, temporary facilities may be permitted to maintain, restore, or enhance fisheries if the stocks have been reduced or are threatened as long as the facilities do not significantly detract from wilderness values. New permanent facilities will not be permitted in designated wilderness for fishery management purposes unless they are essential to accomplish refuge management objectives. New permanent facilities may be permitted outside of designated wilderness provided these facilities are supported by a viable management strategy of an approved fishery management plan. The potential impacts of any activity on fish habitats and populations will be carefully evaluated prior to permitting any activity on the refuge. All streams on the refuge will be considered potential spawning-rearing-migration route waters until stream studies are completed, proper methods of evaluating yearly escapement to spawning areas are established, and critical spawning, rearing, and overwintering habitat is identified.

Little commercial harvest occurs within the refuge boundaries, but salmon stocks that spawn on the refuge are subject to harvest in the mixed stock commercial fishery in the Yukon River. Commercial and subsistence fisheries are managed on a sustained yield basis in accordance with regulations set by the Alaska Board of Fisheries and policies of the Fish and Wildlife Service, incorporating assignment of subsistence as the highest priority among beneficial uses of the resources. With limited commercial fishing activities on the refuge, the subsistence fishery is subject to very few restrictions in order to give preference to subsistence users.

Fishery management on the refuge would be directed at maintaining subsistence fisheries, and additionally, commercial and sport fisheries. No fishery development activities are currently planned for Yukon Flats Refuge waters. Opportunities for subsistence harvest of fish resources would continue to be protected as described under the subsistence section of this chapter. Sport fishing will continue to be permitted in all refuge areas, subject to action by the Board of Fisheries. However, production capacity is limited and intensive sport fishing may impact fish populations. If necessary, restrictions may be imposed to control the harvest of some populations.

National Resource Species - Coho and chinook salmon have been identified by the Service as national resource species. The Service has developed general management strategies for each species in its Alaska Regional Resource Plan. The strategies relevant for refuges, such as collecting survey data,

monitoring populations, and protecting habitats, are reflected in the management directions developed for this plan. Specific actions that may need to be taken on the refuge will be addressed in future management plans.

Water Quality. All facilities and activities on the Yukon Flats Refuge will comply with pollution control standards set by the Clean Water Act, the Federal Water Pollution Control Act Amendments, Alaska water quality standards (Alaska Department of Environmental Conservation 1979), and all other applicable state and federal laws, regulations. and orders governing water quality (see Refuge Manual, 5 RM 11). The Service will cooperate with the Alaska Department of Natural Resources (Division of Land and Water Management), Alaska Department of Environmental Conservation, ADF&G, and other appropriate agencies responsible for establishing and enforcing water quality standards, and is empowered to set its own standards if needed to protect fish and wildlife populations and habitats.

Water quality parameters for most of the Yukon Flats Refuge are unknown. The Service, working with the state, will develop a water resource management plan which will include important water quality measurements. It is essential to collect baseline data as soon as feasible so that changes due to human activity can be documented and corrected. The Service may cooperate with adjacent landowners in collecting these data.

Important sampling sites for collecting baseline water quality data include streams and lakes near sources of potential pollution on or near the refuge. Present or future developments that may impact water quality include mining claims, administrative sites, public use cabins, and private camps or cabins. Habitat improvement activities can also affect water quality and quantity.

Water quality measurements should be taken around times of low flow. Both water and sediment should be collected. To ensure that the result have legal standing, sampling programs will be designed and carried out and analyzed by Service-approved agents. Important parameters to measure in all samples include: temperature, pH, conductivity, alkalinity, hardness, suspended solids (turbidity), and settleable solids (sediment). Other parameters to measure depend on the suspected sources of pollution, but include levels of at least ten heavy metals, petroleum hydrocarbons, several nutrients, dissolved gases, and fecal coliform bacteria.

Selected fish and wildlife also should be tested for accumulated contaminant levels if pollution is suspected. Some important indicator species are filter-feeders, such as freshwater clams, and predators, such as salmonids, bald eagles, and grizzly bear.

Refuge staff will advise adjacent landowners to ensure awareness of potential pollution threats and to coordinate protection of water quality among all concerned parties. Any pollution of refuge waters will be reported to appropriate state and federal agencies.

The Service recognizes there is a potential for oil and gas spills affecting the refuge. The sensitive nature of refuge resources, such as salmon spawning areas, and the difficulty of containing spills make any fuel or oil spills a special concern. To minimize damage to the resources in and adjacent to the refuge, the Service will work with other federal and state agencies in initiating, reviewing, and responding to oil and fuel spill contingency planning requirements.

The Service will cooperate and work closely with the Environmental Protection Agency, the Bureau of Land Management, and the Alaska Department of Environmental Conservation in the development of a plan to rectify the current

water quality problems on Birch Creek associated with placer mining operations upstream from the refuge boundary.

Water Rights. The water resources of the Yukon Flats Refuge will be managed to maintain the primary purposes of the refuge, as stated in Section 302(9)(B) of ANILCA and in other statutory mandates. Specific water resource requirements for the primary purposes of the refuge will be identified and the reasonable amount of water necessary to maintain these purposes will be quantified in cooperation with the State of Alaska. Once Federal Reserved Water Rights (FRWR) have been quantified, the Service will record this information with the Alaska Department of Natural Resources. Water for secondary purposes and other uses not provided for by FRWR will be applied for in accordance with Alaska Statutes (AS) 46.15.

Following adoption of the comprehensive conservation plan for the Yukon Flats Refuge, a water resource management plan will be prepared. This plan will identify streams, lakes, and other water bodies whose protection has highest priority and will outline procedures for quantifying their FRWR. The Service will cooperate with the state in obtaining these data.

Instream flow studies will investigate the full annual range of flow, as both flood and low-water stages are essential, or even critical, in the life cycles of wetland and aquatic species. Extreme flood and drought years will also be included in the analysis, as both are important to the renewal of aquatic habitats. Once year-round instream flow requirements have been quantified, the Service will continue to monitor streams which may be subject to modification both within and outside the refuge. The Service will contact other water users if the Service determines that a proposed project threatens refuge waters, fish, or wildlife. Reductions in instream flows, lake elevations, or groundwater levels below the FRWR will be reported to the appropriate state or federal agencies so that action can be taken to maintain the purposes for which the refuge was established.

Air Quality. All activities on the refuge will comply with the Clean Air Act, as amended, and all other applicable state and federal laws, regulations, and orders. The Service will cooperate with the Alaska Department of Environmental Conservation and other appropriate agencies responsible for establishing and enforcing air quality standards.

To protect refuge resources from pollution, the Service will take an active role in monitoring development outside the refuge which could affect refuge air quality. Contact with adjacent landowners will continue to ensure awareness of potential pollution threats and to coordinate protection of air quality among all concerned. Pollution problems identified will be reported to the appropriate state and federal agencies so action can be taken to prevent significant deterioration of air quality.

Shorelands, Tidelands, and Submerged Lands. The Submerged Lands Act of 1953, the Alaska Statehood Act of 1958, and the state constitution provide for state ownership of water (subject to the reservation doctrine discussed under water rights), shorelands, and submerged lands.

Determinations of what waters are navigable is an ongoing process in Alaska at both the administrative and judicial levels. Navigability determinations have been made by the BLM on many of the waterbodies on the refuge, either as part of the conveyance process or through BLM's regional planning. Pursuant to

Section 901(g) of ANILCA, those determinations are for the purpose of determining title to lands beneath navigable waters as between the United States and the State of Alaska. Refuge waters determined to be navigable are identified in the Land Status section of the Physical Environment chapter. Other water bodies may be determined to be navigable in the future.

The Service will work cooperatively with the state to ensure that existing and future activities occurring on the shorelands, tidelands, and submerged lands are compatible with the purposes for which the refuge was established. In the future the Service may propose management actions to the state for these areas. The Service will pursue cooperative agreements with the state for the management of lands under navigable water bodies.

Management of Watercolumns. The Service has authority to regulate certain activities on watercolumns to protect refuge lands, to protect the use of navigable waters for fishing, boating, and other recreational uses, and for conservation purposes. These authorities stem from two provisions of the United States Constitutions (the Property Clause and the Commerce Clause), ANILCA, and other authorities including the National Wildlife Refuge Administration Act of 1968, the 1899 Rivers and Harbors Act, the Fish and Wildlife Coordination act of 1958, and the Migratory Bird Treaty Act. The State of Alaska also has authority to manage water based on the laws cited in the section on shorelands, tidelands, and submerged lands above. These laws provide for water management by both the State and the Service.

The Service will pursue cooperative management agreements with the State of Alaska regarding public uses on waterways in the refuge. Cooperative agreements will be pursued only if a case-by-case resolution of management issues proves unacceptable to the Service and the State. The Service will oppose any uses of waterways that will adversely affect water quality or the natural abundance and diversity of fish and wildlife species in the refuge.

Visual Resource Management. In all alternatives the Service will identify and maintain the scenic values of the refuge and minimize the visual impact of developments. Refuge facilities and commercial use support facilities will be designed to blend into the landscape. The Service will cooperate with state agencies to prevent any significant deterioration of visual resources.

Cultural/Historical Resources. All significant historic, archeological, paleontological, and cultural resources on the refuge will be protected and managed in accordance with federal and state law. Prior to initiating actions resulting in alteration to structures or ground disturbance, project areas will be surveyed to determine if cultural resources are present. Private interests proposing to conduct economic activities on the refuge will be requested to assist in funding these site-specific surveys. Should cultural resources be found, they will be evaluated for significance (i.e., eligibility for inclusion on the National Register of Historic Places) and a decision on appropriate action (e.g., mitigation by avoidance, partial or total salvage, site hardening) will be made. All action will be taken in consultation with the State Historic Preservation Officer, the Advisory Council on Historic Preservation, and other agencies as appropriate. Care must be taken to ensure that sites are not unnecessarily destroyed or developed.

Inventory and evaluation of cultural resources on the refuge will continue as funding permits (as directed by the 1980 amendments to the National Historic Preservation Act). Qualified social scientists will be encouraged to undertake surveys and research on the refuge to assist the Service in this effort.

The Service will continue to cooperate with the Bureau of Indian Affairs (BIA) and the BLM in conveying cemeteries and historic places to Doyon, pursuant to section 14(h)(1) of ANCSA.

Fire Management. The refuge is within the Upper Yukon-Tanana Fire Management Planning Unit which has an approved fire management plan designating levels of suppression throughout the planning area. Levels of suppression efforts are commensurate with the value of resources warranting protection. Private inholders (i.e. Native regional and village corporations) were involved in the preparation of this plan. Buffer zones around private lands were established in the plan as a result of input from the Native regional and village corporation. (Refer to the AIFMC-Tanana/Minchumina fire plan for a discussions of wildland fire ecology and management, suppression options, and environmental assessment.)

Fires will generally be allowed to burn naturally where not endangering life or property. If fire suppression becomes necessary, state of the art techniques and the "minimum appropriate tool" concept will be utilized. Private lands within or adjacent to the refuge and special value refuge lands will receive the maximum protection practicable from fires. The effects of wildfire on refuge wildlife populations and habitats will be closely monitored and will be subject to ongoing research.

SUBSISTENCE USE MANAGEMENT

Under Title III of ANILCA, one purpose of the Yukon Flats Refuge is to provide the opportunity for continued subsistence uses by local residents. Title VIII of ANILCA further provides that rural Alaskan residents engaged in a subsistence way of life be allowed to continue using refuge resources for traditional purposes. Subsistence uses of refuge resources will be given preference over recreational hunting and fishing and other consumptive uses when necessary to maintain healthy resource populations.

The State of Alaska can, under Title VIII, continue managing subsistence uses of fish and wildlife on federal lands if it enacts and implements laws to provide for subsistence preferences and if it assures local involvement in management of subsistence resources. The Service will support the state in meeting those responsibilities under all alternatives. Currently the taking of fish and wildlife for subsistence and other purposes on the Yukon Flats Refuge is as prescribed by regulations established by the Alaska Boards of Fisheries and Game.

Although the state's program for subsistence management and use generally governs subsistence use of fish and wildlife on the refuge, other duties remain vested in the Department of the Interior. Among the most important of these statutory duties are those required by Section 806. Under all alternatives the Service will monitor both the status of fish and wildlife populations harvested for subsistence uses and the State fish and game regulatory system. This monitoring is intended to identify potential problems related to allocation of resources before populations of fish and wildlife become depleted, and to ensure that preference is given to subsistence users as required by law.

The Service has developed, with the state and other federal land management agencies, subsistence monitoring guidelines and will participate in subsistence monitoring with ADF&G, the local fish and game advisory committee, the Interior Regional Council, and the Boards of Fisheries and Game. The Service will provide those organizations with information on the status of

subsistence resources and management of the refuge, data needs related to subsistence, and comments on regulatory proposals that affect subsistence uses of fish and wildlife on the refuge.

The Service will also evaluate the effects of proposed activities on subsistence use under all alternatives to ensure compliance with section 810 of ANILCA. When a decision is to be made on "whether to withdraw, reserve, lease, or otherwise permit the use, occupancy, or disposition" of refuge lands, the effect of the proposal on subsistence uses and needs, the availability of lands for the proposed activity, and other alternatives to the proposal will be evaluated. The Service will work with the ADF&G subsistence division and other appropriate local sources to determine whether a proposed activity "significantly restricts" subsistence uses. If the Service determines that a proposal would probably result in adverse affects to subsistence use, then the Service would follow the formal procedures identified in Section 810 before making a final decision on the proposal.

Access to refuge lands by traditional means will be permitted for subsistence purposes, subject to reasonable regulation, in accordance with Section 811 of ANILCA. Traditional means, as indicated in Section 811, include snowmachines, motorboats (excluding air and air-cushion boats), dog teams, and other means of surface transportation traditionally used by local rural residents engaged in subsistence activities. Use of these traditional means of travel will be in compliance with state and federal law, in such a manner as to prevent waste or damage to the refuge, and in such a manner as to prevent herding, harassment, hazing, or driving of wildlife for hunting or other purposes.

Under Section 816 the Service may close the Yukon Flats Refuge to the taking of fish and wildlife if necessary for reasons of public safety, administration, or to assure the continued viability of particular populations of fish or wildlife. Emergency closure to subsistence taking will occur only after all other consumptive uses are eliminated.

Although Titles III and VIII of ANILCA require the Service to maintain opportunities for, and give preference to, subsistence harvest of fish and wildlife on the refuge, these requirements are subject to all other laws governing management of particular species or species groups.

ACCESS AND TRANSPORTATION

In all alternatives reasonable access on to the refuge will be ensured so visitors can participate in fish and wildlife-oriented activities. Title XI of ANILCA includes provisions for evaluating and developing transportation systems within and/or through the refuge. Under all alternatives non-motorized access will be encouraged. Use of off-road vehicles (ORV's), air boats, and air-cushion boats for recreational purposes will be prohibited under all alternatives, except on specifically designated routes or in specifically designated areas and subject to the provisions of Title XI of ANILCA. Use of helicopters will be permitted on the refuge only with issuance of a special use permit. Cooperative management will be sought with the state and others who have ownership or other rights which affect access to or across refuge lands.

Section 1110(a) Access Requirements. Under Section 1110(a) of ANILCA the Service will permit the use of snowmachines (during periods of adequate snow cover), motorboats, airplanes, and non-motorized surface transportation

methods for traditional activities on all refuge lands, and for travel to and from villages and homesites. These uses will be subject to reasonable regulations to protect the natural and other values of the refuge. The uses shall not be prohibited unless the Service determines, after notice and hearings in the vicinity of the affected area, that it would be detrimental to the resource values of the refuge. This plan will not by itself restrict or close access. Restrictions or closures will result from subsequent rulemaking actions that conform to the procedural requirements of section 1110(a).

Section 1110(b) Access Requirements. Under Section 1110(b) of ANILCA the Service will give, in any case in which State owned or privately owned land, including subsurface rights of such owners underlying public lands, or a valid mining claim or other valid occupancy is within or is effectively surrounded by one or more national wildlife refuges or other conservation system unit, the owner or occupier is given such rights as may be necessary to assure adequate and feasible access for economic and other purposes to the concerned land. These rights are subject to reasonable regulations to protect the natural and other values of such lands. This plan cannot by itself restrict or close access.

RS 2477 Rights-of-Way. Revised Statute 2477 (formally codified at 43 U.S.C. 932; enacted in 1866) provides that: "The right-of-way for the construction of highways over public lands, not reserved for public uses, is hereby granted." The Act was repealed by P.L. 94.570 as of October 21, 1976, subject to valid existing claims. The Yukon Flats Refuge is subject to valid existing rights, including rights-of-way established under RS 2477. The validity of these rights-of-way will be determined on a case-by-case basis.

A map illustrating the rights-of-way that the state contends may be valid under RS 2477 for the Yukon Flats Refuge is included as Appendix J of this document. This map is not necessarily all inclusive. Private parties or the State of Alaska may identify and seek recognition of additional RS 2477 rights-of-way within the refuge. Supporting material regarding those rights-of-way identified by the state may be obtained through the Alaska Department of Transportation and Public Facilities or the Alaska Department of Natural Resources.

Identification of potential rights-of-way in the map does not establish the validity of these RS 2477 rights-of-way and does not necessarily provide the public the right to travel over them. All RS 2477 rights-of-way within the refuge shall be subject to appropriate state and federal laws and regulations.

Section 17(b) Easements. Sites and linear access easements may be reserved on Native corporation lands that are within or adjoin the Yukon Flats Refuge, as authorized by Section 17(b) of the Alaska Native Claims Settlement Act (ANCSA). The Service will be responsible for management of these public access easements inside the refuge, and for those assigned to the Service outside the unit. Pursuant to Part 601, Chapter 4.2 of the Department of the Interior Departmental Manual (601 DM 4.2) where these easements access or are part of the access to a conservation system unit, the easement shall become part of that unit and be administered accordingly. The purpose of 17(b) easements is to provide access from public lands across these private lands to other public lands. The routes and location of these easements are identified on maps contained in the conveyance documents. Conveyance documents also

specify the terms and conditions of use including periods and methods of public access.

The Service will work cooperatively with the affected Native corporations and other interested parties, including the State of Alaska, to develop a management strategy for the easements. Management of these easements will be in accordance with the specific terms and conditions of the individual easements and applicable refuge regulations. As the easements are reserved and the Service assumes management responsibilities for them, the locations, mileages, and acreages will be compiled and management strategies will be formulated. This information will be maintained at the refuge headquarters.

As authorized in 601 DM 4.3G, the physical location of an easement may be adjusted to rectify a usability problem or to accommodate the surface and/or subsurface landowner's development of the lands if both the Service and the landowner agree to the relocation. Easements also may be expanded if an acceptable alternate easement or benefit is offered by the landowner and the exchange would be in the public interest. An easement may be relinquished to the landowner if an alternative easement has been offered by the landowner or termination of the easement is required by law. The Service may also propose to place additional restrictions (to those authorized in the conveyance document) on the use of an easement if existing uses are in conflict with the purposes of the refuge. In all cases where a change is proposed in authorized uses or location from the original conveyance, the Service will give adequate public notice and opportunity to participate and comment to the affected Native corporation and other interested parties, including the State of Alaska. Service proposals for changing the terms and conditions of 17(b) easements will include justification for the proposed change, an evaluation of alternatives considered, if any, and an evaluation of potential impacts of the proposed action.

Non-Exclusive Use Easements. Non-exclusive use easements may be reserved by BLM across Native allotments when trails or areas of prior established public use overlap an allotment application.

Note: The various types of access routes discussed above may overlap. For example, a valid RS 2477 right-of-way may overlap an easement conveyed under Section 17(b) of ANCSA. Management strategies, where this occurs, will reflect valid existing rights and other considerations unique to the situation. The Service will work cooperatively with interested parties to assure that management is compatible with the purposes of the refuge. Overlap situations will be dealt with on a case-by-case basis in conformance with the management policies outlined in other sections of this plan.

Dalton Highway Corridor. The Alaska Department of Transportation and Public Facilities may need, in the future, to realign the Dalton Highway to meet safety standards. Such realignment within the existing BLM road corridor would not be affected by the CCP. Should realignments be proposed involving adjacent refuge lands, however, the Service would conduct an environmental analysis, under Title XI of ANILCA and NEPA, to determine if the proposal is compatible with the purposes of the refuge and consistent with the plan. Use of existing material sites along the Dalton Highway are not affected by this plan as they are located within the BLM corridor. A similar analysis process, however, would be required should material sites be proposed on refuge lands in the future.

PUBLIC USES

Recreational Uses. A wide range of wildlife and wildlands recreational opportunities (e.g., sport hunting and fishing, river floating, and associated activities) will continue to be allowed on the refuge under all alternatives. Recreational use will be regulated and managed to avoid overcrowding and to avoid adverse impacts on historical/cultural resources, fish and wildlife populations and habitats, and wilderness and other special values. Actions that may be taken to minimize impacts include regulating access (subject to the provisions of Section 1110(a) of ANILCA), recommending changes in state hunting and fishing regulations to ADF&G and the Alaska Boards of Fisheries and Game, limiting commercial guiding and outfitting activities, and encouraging through interpretive and educational programs user behavior that is sensitive to wildlife, fish, and wildland resources. A few recreational opportunities may be seasonally or otherwise restricted to minimize user conflicts or avoid adverse impacts.

Recreational use by unguided visitors will be managed through information programs and voluntary compliance. Direct restrictions of use, such as limiting numbers of users in an area, will be avoided unless voluntary methods fail. Commercial recreational use (e.g., guided use) will continue to be regulated by permits, as required under Service regulation.

Education/Interpretation. The success of most of the management activities outlined in this plan will depend to a large extent on the actions of refuge users, adjacent landowners, local residents, and other interested citizens. An effective educational/interpretive program will help avoid potential problems by increasing public understanding of and support for refuge management goals and actions.

The Service will concentrate its initial efforts on informing adjacent landowners and local residents about the refuge and the Service, and ensuring that users are aware of and respect private lands adjacent to the refuge. The general brochure on the history, background, and special values of the refuge will be updated and distributed.

As use increases in the future, the Service will expand its educational/interpretive program for the Yukon Flats Refuge. Brochures, posters, and similar publications will be prepared to inform visitors about recreational opportunities on the refuge and about special areas, such as spawning areas, and waterfowl nesting/staging areas. Visitor contact facilities may be developed on the refuge, in Fairbanks, or in association with the planned interagency center in Anchorage. In cooperation with the State of Alaska, the Service will focus its environmental education efforts on assisting teachers in Fort Yukon and other villages on the Yukon Flats. All of these actions should increase local resident and visitor awareness and understanding of the local environment, the refuge, and the Service's management programs.

Cabin Management. Fish and Wildlife Service regulations on existing cabins within Alaskan refuges (50 CFR 36.33(b)(1)) state that traditional and customary uses of these cabins (e.g., commercial guiding, subsistence uses) will be allowed to continue if the Service determines the uses are compatible with the purposes for which the refuge was established. Nontransferable, renewable five-year special use permits shall be issued for these existing cabins. No permits shall be issued to authorize the use of a cabin for private recreational use.

Non-transferable, five-year special use permits may be issued by the Service for new cabins. The use of the cabin must be either directly related to the administration of the refuge or is necessary to provide for the continuation of an on-going activity or use otherwise allowed within the refuge. In determining whether to permit the use, occupancy, construction, and maintenance of cabins, the Service shall be guided by factors such as other public uses, public health and safety, environmental and resource protection, research activities, protection of historic or scientific values, subsistence uses, threatened and endangered species conservation, scenic and aesthetic values, and other management consideration necessary to ensure that the activities authorized by the permit are compatible with the purposes for which the refuge was established. According to section 1303 of ANILCA, the construction of new cabins for private recreational use on the Yukon Flats Refuge is prohibited.

Litter and Waste Control. Under Service regulations (50 CFR 27.94) littering, disposing, or dumping of garbage, refuges, sewage, or other debris on refuges is prohibited except at points or locations designated by the refuge manager. Litter disposal is the responsibility of individual refuge users. If waste disposal and litter control problems occur on the refuge the Service will increase its public education and law enforcement efforts.

ECONOMIC USE MANAGEMENT

Alaska Mineral Resource Assessment Program. Section 1010 of ANILCA requires that all federal lands in Alaska be assessed for their "oil, gas, and other mineral potential," although Section 304(c) prohibits "new" hardrock mineral leasing on refuges. To complete the assessment program, mineral assessment techniques that do not result in lasting impacts on refuge resources, such as side-looking radar imagery, will be permitted throughout the refuge. The Service will issue special use permits, with stipulations, to ensure that the assessment program is compatible with refuge purposes. For example, stipulations may limit access during nesting, spawning, or other times when fish and wildlife may be especially vulnerable to disturbance.

Oil and Gas Exploration and Development. An oil and gas basin has been identified in the southern and eastern portion of the Yukon Flats Refuge. The Bureau of Land Management (BLM) has developed an oil and gas resource assessment of the refuge (Banet et al. 1987). This report includes an assessment of the economic potential of the area and the viability of development, which states:

> "The YFNWR (Yukon Flats National Wildlife Refuge) has been determined to be an area of "low" economic development potential for oil and gas resources. As previously indicated, no drilling has occurred on the refuge and exploration wells in close proximity to the refuge have been unsuccessful. Tertiary sediment volume, depth, and continuity in the Yukon Flats cenozoic basin are considered questionable. The interpreted results of geophysical studies could not be considered very promising. In conjunction with these facts, the physical remoteness of the area, lack of infrastructure, inclusive of the nonexistence of roads, would result in high capital costs to industry to explore and develop this area. The closest existing production to

this refuge is in the Prudhoe Bay field approximately 250 miles to the north. It is expected that industry, in ranking this area against other investment opportunities, would be strongly inclined to focus their interest on areas showing greater promise."

The Secretary of the Interior will consult with the Secretary of Energy, as required in Section 1008(b) of ANILCA, regarding the national interest in producing oil and gas on the Yukon Flats Refuge.

Oil and Gas Studies. Oil and gas studies include surficial geology studies, subsurface core sampling, seismic exploration, and other geophysical exploration. All of these activities may be allowed throughout the Yukon Flats Refuge, including designated minimal management areas and proposed wilderness areas, where site-specific stipulations can be designed to ensure compatibility with refuge purposes and consistency with management objectives set forth in the CCP. However, no seismic activities will be allowed on the refuge prior to the issuance of a record of decision on this plan.

Should Congress designate wilderness within the refuge, no exploration activities involving surface disturbance or mechanized transportation would be allowed after designation except for those conducted by (or for) an Interior Department agency under the provisions of Section 1010 of ANILCA. These provisions require regulations to ensure that activities do not result in lasting environmental impacts and are compatible with refuge purposes.

Oil and Gas Leasing. Under Section 1008 of ANILCA, oil and gas leasing can occur on Alaska refuges if it is determined that these activities can be made compatible with the purposes for which the refuge was established. A 1982 Memorandum of Understanding between the U.S. Department of the Interior, U.S. Department of Agriculture, and the State of Alaska states that the refuge comprehensive conservation plans will be the vehicle used to determine if oil and gas leasing and development activities may be compatible with the purposes of Alaska refuges. The Memorandum of Understanding can be found in Appendix I.

If it is determined that oil and gas leasing is compatible, leasing may be allowed on areas of the Yukon Flats Refuge which are under intensive and moderate management. These activities would be subject to site-specific stipulations designed to ensure compatibility with refuge purposes and consistency with management objectives. Leasing may be allowed in areas under minimal management only if determined to be in the national interest. In Congressionally designated wilderness, leasing would not be allowed. No formal leasing program will be initiated until the oil and gas potential of the refuge has been assessed by the BLM and a determination is made that leasing would be in the national interest. When these steps have been completed, the plan may require modification if it is found that it is in the national interest to lease in areas of the refuge under minimal management. If this occurs, the Service would revise the plan in compliance with the NEPA process, providing opportunities for public involvement.

Locatable Hardrock Minerals. Section 304(c) of ANILCA closed the Yukon Flats Refuge to prospecting, development, extraction, and removal of locatable hardrock minerals (e.g., gold, silver, uranium, zinc). If a valid right existed prior to the enactment of ANILCA, mining could occur under all of management categories in all the management alternatives.

Under all alternatives, impacts associated with mining would be mitigated in accordance with Service regulation. A Plan of Mining Operation would be requested of each claim or patent holder within the refuge boundary. The plan would include specific descriptions of items such as: the location and boundaries of the claim or patent, description of the deposits, means and routes of access, development activities and methods, methods of preventing or mitigating impacts, and a reclamation plan. The plan of mining operation filed with the refuge staff would be in addition to any applications required by the state or other agencies.

Coal and Geothermal Resources. Coal mining is prohibited on the Yukon Flats Refuge under Section 16 of the Federal Coal Leasing Amendment Act of 1975 (P.L. 94-377).

No geothermal leasing is allowed on the refuge under Section 1014(c) of the Geothermal Steam Act (30 U.S.C. 1001-1021).

Transportation and Utility Systems. Under Title XI of ANILCA, transportation and utility systems could be constructed on or across refuges, including through wilderness (with Congressional approval), in all management categories under all alternatives. Any proposed system would be evaluated to determine its environmental impacts and would be permitted if it is determined that such system would be compatible with purposes for which the refuge was established and there is no economically feasible and prudent alternative route for the system.

Other Economic Uses. Commercial recreation operations (e.g., big game guiding, river guiding, fly-in tent camps) will be permitted on the refuge. These activities are authorized by refuge special use permit under 50 CFR 27.97. (The type and number of big game guides and their guiding areas are regulated by the State Guiding Board, though a special use permit is also required.) The Service will attach conditions to these permits to ensure that facilities, access methods, and activities are consistent with the selected alternative. The Service will monitor the number and type of activities on the refuge and will take action, if necessary, to regulate use.

Commercial fishing activities, including all land based sites, activities, and facilities on the refuge (e.g., campsites, cabins, motorized vehicles, landing strips), may be permitted subject to reasonable regulation in accordance with Section 304(d) of ANILCA.

Other commercial activities, such as commercial agricultural development, timber harvest, or sand and gravel removal, may be permitted on the refuge in areas under intensive management (commercial timber harvest is also allowed under moderate management). The preferred alternative contains no intensive or moderate management areas. Special use permits would be required, under 50 CFR 27.97, to authorize these activities. Conditions would be attached to these permits to ensure that the activities are consistent with the selected alternative and the purposes of the refuge. The Service will monitor these activities to ensure that they are not adversely affecting the ability to meet refuge purposes.

Livestock grazing (including reindeer grazing), hydroelectric development, and other commercial activities have been determined to be incompatible with refuge purposes due to potential adverse effects on the refuge populations of moose, bear, salmon, and other fish and wildlife species. They would not be permitted under any alternative included in this plan.

WILDERNESS SUITABILITY

Section 1317 of ANILCA requires the Service to study the refuge and determine which areas are suitable, and subsequently recommend areas, for inclusion in the National Wilderness Preservation System.

Section 4(a) of the Wilderness Act states that "The purposes of this Act are hereby declared to be within and supplemental to the purposes for which . . . units of the . . . national wildlife refuge systems are established and administered . . ." Therefore, a range of wilderness alternatives is evaluated subsequent to the Service's selection of its preferred management alternative. Alternatives may range from the inclusion of all lands determined to be qualified to a proposal that no additional wilderness be recommended.

Since most of the federal land in Alaska qualifies for wilderness designation, the Service has developed additional criteria to determine the preferred wilderness proposal. These criteria are:

- the need for wilderness unit boundary adjustments; and
- the addition of selective areas with outstanding resource values that may have been inadvertently overlooked during the original wilderness review and subsequent designations undertaken by Congress.

The Service used these two criteria in developing the wilderness proposal for its preferred alternative. Lands were proposed for wilderness designation if they have outstanding resource values that were overlooked by Congress in the ANILCA wilderness designations. Lands were also proposed if they were adjacent to existing wilderness areas and logically belonged in the wilderness area, but were not designated as wilderness by ANILCA (e.g., adjustments to the wilderness boundary that would incorporate an entire watershed or drainage basin into the wilderness area). In all cases, the federal government must own both the surface and subsurface rights of these areas.

Following public meetings held in conjunction with the Yukon Flats CCP/EIS, the Service's recommendation for wilderness will be sent to the Secretary of the Interior. The Secretary's wilderness recommendation then will be forwarded to the President. The President must send wilderness recommendations to Congress by December 1987. Regardless of whether or not the Service's recommended wilderness areas are legally designated as wilderness, all refuge lands in the minimal management category will be managed to preserve their existing fish and wildlife populations and habitat diversity thus preserving their wilderness qualities.

Use of motorized equipment in wilderness areas is governed by the Wilderness Act, ANILCA, and 50 CFR 35.5. Generally, motorized equipment is prohibited by the Wilderness Act. ANILCA makes exceptions for snow machines, motorboats, and airplanes in Section 1110(a). Under 50 CFR 35.5 the Director of the Service is permitted to designate certain areas where other motorized equipment may be used, where its use (or such uses) was established prior to the date the wilderness was established. Motorized equipment such as chainsaws and generators are currently used on the Yukon Flats Refuge; only subsistence users could continue to use these types of motorized equipment in wilderness.

WILD AND SCENIC RIVER MANAGEMENT

That portion of Beaver Creek National Wild River lying within the Yukon Flats Refuge will be managed according to the policies and guidelines

established in the River Management Plan for the Beaver Creek National Wild River. Should either the Sheenjek or Porcupine rivers be designated as National Wild Rivers by Congress, similar river management plans would be developed for the management of these rivers.

ADMINISTRATIVE AND VISITOR FACILITIES AND SERVICES

With implementation of the preferred plan and development of step-down resource management plans, the need for additional administrative and visitor facilities for the purposes of assuring the preservation, protection, and proper management of the refuge may become evident. Under Section 1306 of ANILCA, the Secretary of the Interior may establish administrative sites and visitor facilities within the refuge or outside the boundaries, but in the vicinity, of the refuge. To the extent practical and desirable, the Secretary shall attempt to locate such sites and facilities on Native lands in the vicinity of the refuge.

Under Section 1307 of ANILCA, any persons who, on or before January 1, 1979, were engaged in adequately providing any type of visitor service within the refuge will be permitted to continue providing such service or services provided they are consistent with the purposes for which the refuge was established. When the need for visitor services arises, preference shall be given to the Native corporation most directly affected and to local residents when selecting persons to provide (and in contracting for the provision of) any type of visitor service, except guiding activities for sport fishing and hunting.

Section 1308 of ANILCA establishes provision for the hiring of individuals who, by reason of having lived or worked in or near the refuge, has special knowledge or expertise concerning the natural or cultural resources of the refuge and the management thereof. The Yukon Flats Refuge has employed local residents in the past and will continue to hire local residents in the future, as appropriate, regardless of the alternative implemented.

REFUGE MANAGEMENT PLANS

Following adoption of one of the alternatives as the comprehensive conservation plan for the Yukon Flats Refuge and completion of the Record of Decision, detailed refuge management plans will be prepared for the refuge. These plans will describe the specific actions that will be taken to implement the general directions outlined in the comprehensive plan. They form the basis for annual work planning and budgeting. Topics that will be addressed in the refuge management plans include specific needs and management requirements for moose, lynx, Dall sheep, waterfowl, and other important wildlife species, fisheries, water resource management (e.g., identification of significant waters and schedule for quantifying water requirements), fire management, cultural resource management, wilderness management, wild river management, public use management, and the environmental education/ interpretation program.

The Service will work closely with other federal and state agencies, including the ADF&G, the State Historic Preservation Officer, and the BLM, in developing the Yukon Flats Refuge management plans.

DESCRIPTION OF THE ALTERNATIVES

Based on the purposes, resources, issues, and opportunities unique to the Yukon Flats Refuge, five alternatives have been formulated to guide management of the refuge. The alternatives are general in nature, providing broad strategies for management of refuge resources and uses. Each alternative designates areas within the refuge using the management categories described previously in this section. Though the alternatives share common strategies, each alternative has a distinct overall emphasis. All the alternatives comply with existing laws, regulations, and Service policies. The common management directions described in the preceding section provide a common base on which each of the alternatives is built. These management directions represent the minimum level of resource management under any of the proposed alternatives.

Each alternative includes a map showing the location and size of the management areas in the five alternatives. Each management category is depicted by a different pattern, providing a quick means to identify the management direction and emphasis of the alternatives. Table 19 at the end of this chapter summarizes the four alternatives and their major differences.

ALTERNATIVE A
The Current Situation

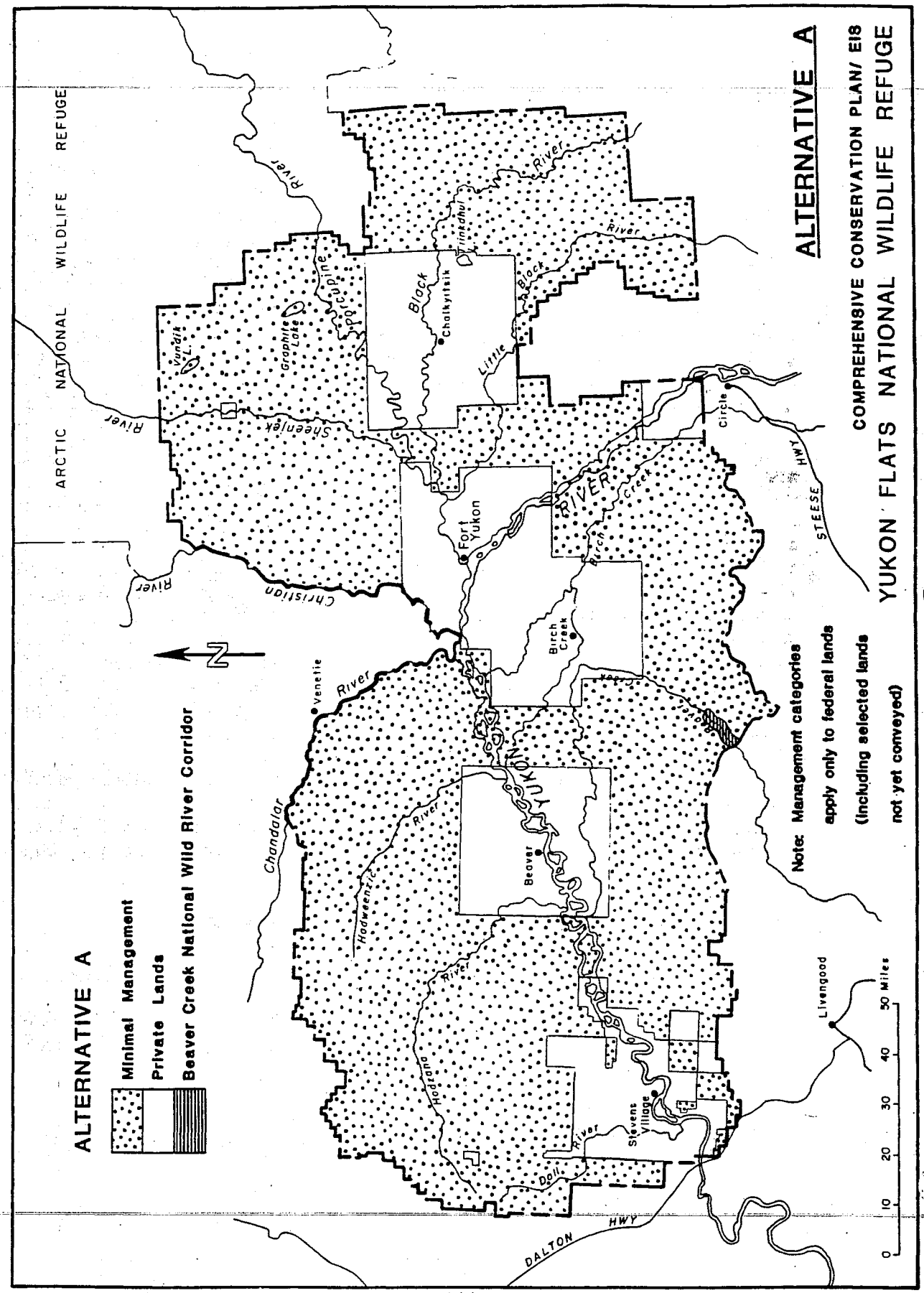
Alternative A, the "no action" alternative, would maintain the existing range and intensity of management actions and recreational and economic uses which now occur on the Yukon Flats Refuge. It represents what now exists, depicting the current level of refuge management being carried out by the Service on the Yukon Flats Refuge. All refuge lands are (and would continue to be) managed under the minimal management category as shown in Figure 25 and Table 14. It is assumed that existing laws, executive orders, regulations, and policies governing Service administration and operation of the National Wildlife Refuge System would remain in effect.

Maintenance of the natural diversity of fish and wildlife populations and habitats on the refuge is a primary objective of current management. The impacts of management activities and public (subsistence and recreational) and economic uses on these populations and habitats are minimized. Ongoing studies

Table 14. Acreage distribution by management category -- Alternative A.

Management Category	Acreage	Percentage of Refuge
Intensive Management	0	0
Moderate Management	0	0
Minimal Management	8,480,000	100%
TOTAL	8,480,000	100%
Proposed for Wilderness Designation	0	0

Figure 25. Alternative A (The Current Situation).



of fish, wildlife, and their habitats would continue. Fish and wildlife populations are managed in cooperation with ADF&G. No habitat is currently being manipulated, although the Service has prepared a prescribed burning plan for the refuge in order to improve moose habitat, to return a portion of the habitat to an earlier vegetational state, and to reduce hazardous fuel loadings. Public and economic uses of the refuge would continue to be allowed using existing access methods. Opportunities for hunting, fishing, and other recreational use, for subsistence resource harvest, and for scientific research would be maintained. No oil and gas leasing would be allowed on the refuge now, although oil and gas studies, including seismic, would be allowed where site-specific stipulations can be designed to ensure compatibility with refuge purposes and consistency with management objectives set forth in the CCP. Table 13 identifies the resource management activities, economic uses, and public uses which would be allowed under this management strategy.

The pristine conditions and fish and wildlife values found on the refuge would be maintained, but no refuge lands would be protected by potential designation as wilderness.

The following management directions summarize Alternative A. Alternative A would:

- maintain the refuge in a basically undeveloped state;
- emphasize the maintenance of the refuge's natural diversity and key fish and wildlife populations and habitats;
- maintain traditional access opportunities;
- provide opportunities for continued subsistence use of refuge resources;
- maintain opportunities for hunting, fishing, and other recreational activities;
- permit the continuation of current economic activities;
- maintain current management of the Beaver Creek National Wild River (as per approved management plan); and
- propose no areas of the refuge for wilderness designation.

FISH AND WILDLIFE MANAGEMENT

In Alternative A, the Service would emphasize maintenance of, to the maximum extent possible, the natural diversity of fish and wildlife populations and habitats on the refuge and minimizing the impacts of management activities and public and economic uses on these populations and habitats. In particular, emphasis would be placed on maximizing protection of wetlands and the waterfowl populations they support. Management activities which are presently occurring on the refuge are limited to population surveys (including waterfowl, moose, Dall sheep, salmon and other fish species, and raptors), habitat studies (including aquatic studies), and biological research (related primarily to the low moose population found in much of the refuge). On-going surveys and biological research would continue and additional studies would be initiated as funding and staff are available. Habitat improvement and population management activities, with the exception of state harvest regulations (for hunting, fishing, and trapping) and proposed prescribed burning (10,000 to 20,000 acres on a biannual basis), are not occurring on the refuge at the current time. There are no plans to undertake any other habitat improvement (either terrestrial or aquatic) or population management activities on the refuge in the foreseeable future. A number of techniques for restoration and enhancement of fish populations may be allowed on the refuge (including

hatcheries, physical and chemical habitat modification, and supplemental fish production). No plans exist to utilize any of these techniques in the foreseeable future. For additional information on the current status of fish and wildlife habitats and populations on the refuge, see the Biological Environment section of the Existing Environment Chapter. Refer to the common management directions and Table 13 for more detail on fish and wildlife management directions. For purposes of impact analysis a scenario of potential prescribed burning activities on the refuge under Alternative A is presented in the Environmental Consequences chapter.

MANAGEMENT OF OTHER REFUGE RESOURCES

All activities currently occurring on the Yukon Flats Refuge comply with pollution control standards set by the Clean Water Act, the Federal Water Pollution control Act Amendments, Alaska water quality standards, the Clean Air Act as amended, and all other applicable state and federal laws and regulations governing water and air quality (see Refuge Manual 5 RM 11). The Service cooperates with the Alaska Department of Environmental Conservation and other appropriate agencies responsible for establishing and enforcing water and air quality standards.

The Service has not yet undertaken any activities necessary to identify and quantify the specific water resource requirements necessary to meet the primary purposes of the refuge (Federal Reserved Water Rights).

The maintenance of scenic values are considered when undertaking management activities or permitting public and economic uses of the refuge. The Service cooperates with state agencies to prevent any significant deterioration of visual resources on the refuge.

Known historic, archeological, paleontological, and cultural resources on the refuge are being protected and managed in accordance with federal and state law. Site-specific inventories are conducted prior to commencing activities which may result in alteration to structures or in ground disturbance. If cultural resources are found, they are evaluated for significance and a decision on appropriate action is made. Inventory and evaluation of cultural resources on the refuge are continuing as funding permits.

A fire management plan which encompasses the refuge, the Upper Yukon-Tanana Fire Management Plan, has been prepared and approved, as has a refuge fire management plan. This plan designates levels of suppression throughout the planning area. Levels of suppression efforts are commensurate with the value of resources warranting protection. Fires are generally allowed to burn naturally where not endangering life or property. If fire suppression is necessary, state of the art techniques and the "minimum appropriate tool" concept are utilized. Private lands within or adjacent to the refuge and special value refuge land receive the maximum protection practicable from fire. The effects of wildfire on refuge wildlife populations and habitats is closely monitored.

SUBSISTENCE MANAGEMENT

Harvesting of subsistence resources on the refuge is an important activity. Currently the taking of fish and wildlife for subsistence and other purposes on the Yukon Flats Refuge is as prescribed by regulations established by the Alaska Boards of Fisheries and Game, as provided for under Title VIII of ANILCA. The Service is carrying out its responsibilities under Title VIII, monitoring the status of fish and wildlife populations harvested for

subsistence uses, monitoring the state fish and game regulatory system, and evaluating the effects of proposed activities on subsistence resources and uses. Over the life of the plan existing opportunities for the harvest of subsistence resources would be maintained throughout the refuge. Management of subsistence activities would be as described in the common management directions and as identified in Table 13.

ECONOMIC USE MANAGEMENT

Oil and Gas Exploration, Leasing, and Development. With all refuge lands under minimal management, Alternative A would not allow oil and gas leasing on the refuge at this time. However, leasing may be allowed on some areas of the refuge in the future if it is determined to be in the national interest. Oil and gas exploration, including seismic, may be allowed throughout the refuge where site-specific stipulations can be designed to ensure compatibility with refuge purposes and consistency with management objectives set forth in the CCP. All oil and gas studies would be subject to reasonable regulations to minimize impacts to fish and wildlife populations and habitats and subsistence activities. Common management directions and Table 13 provide additional details on oil and gas management. For purposes of impact analysis a scenario of potential oil and gas exploration activities under Alternative A is presented in the Environmental Consequences chapter.

Mineral Development. A limited number of mining claims are located on the refuge. No new mining claims can be filed as Section 304(c) of ANILCA withdrew public lands within National Wildlife Refuges in Alaska from entry and patent under the mining laws. Only limited mining activity is presently occurring on these claims. Work consists primarily of the assessment work required by the Mining Law of 1872 in order to maintain the validity of the mining claim. The level of mining activity on these claims may increase if they are patented. The Service would request a plan of mining operation, including mitigation measures and a rehabilitation plan, for each claim or patent holder within the refuge boundary. Impacts associated with mining would be mitigated in accordance with Service regulations. See locatable hardrock minerals in the Common Management Directions section of this chapter for additional detail. For purposes of impact analysis a scenario of mining activities on the refuge under this alternative (which assumes that activities would remain at current levels for the next 50 years) is presented in the Environmental Consequences chapter.

Commercial Timber Harvest. Commercial timber harvest on the refuge would not be permitted under minimal management, the current management category.

RECREATIONAL USE AND ACCESS MANAGEMENT

In Alternative A, existing opportunities for hunting, fishing, and other recreational uses would be maintained, as would opportunities for scientific research. The number of non-local users participating in recreational activities on the refuge is low (less than 1,000 visitor use days per year). Increased recreational use would occur, although over the next several years use would be anticipated to grow by no more than 250 visitor use days. Improved campsites and administrative cabins could be developed throughout the refuge if necessary to prevent resource degradation or for purposes of public health and safety.

Reasonable access to the refuge is permitted and managed as prescribed in Title XI of ANILCA and Service regulations (50 CFR 36). Use of snowmachines (during periods of adequate snow cover), motorboats, airplanes, and non-motorized surface transportation methods is allowed for participation in traditional activities and for travel to and from villages and homesites. Adequate and feasible access for economic and other purposes is guaranteed to the State and owners of private lands and to holders of valid occupancy rights in or effectively surrounded by refuge lands. Reasonable access on to the refuge is permitted and managed so visitors can participate in fish and wildlife-oriented recreational activities. Use of off-road vehicles (except on designated routes or in designated areas), air boats, and air-cushion boats is not permitted. Use of helicopters is permitted only with issuance of a special use permit.

WILDERNESS REVIEW

All refuge lands are suitable for wilderness designation. Under the current situation, all refuge lands are and would continue to be managed under the minimal management category. Management would continue to be directed at maintaining the pristine nature, fish and wildlife values, and wilderness values of the refuge, but without the formal protection offered by wilderness designation. The Service would maintain the existing wilderness qualities of all lands in the refuge. In Alternative A no refuge lands would be proposed for designation as wilderness.

Wilderness Management Actions. Five significant wilderness designation issues were identified in Chapter II:

- What will be the impact of wilderness designation (or non-designation) on the quality of wilderness values of the refuge?
- What will be the impact of wilderness designation on the level of prescribed burning on the refuge and how will wilderness values be impacted?
- What will be the impact of wilderness designation on harvest levels of timber for commercial purposes on the refuge?
- What will be the impact of wilderness designation on the level of mineral development on the refuge?
- What will be the impact of wilderness designation on the level of oil and gas exploration, leasing, and development on the refuge?

Alternative A would propose no refuge lands for wilderness designation. The only issue of environmental concern under Alternative A is the impact of current and projected management actions on wilderness values. Use of and activities occurring on refuge lands are projected, under the scenario for this alternative presented in the Environmental Consequences chapter, to remain at current levels.

Wilderness values - Under Alternative A the Service would manage all refuge lands under the minimal management category. The management actions under this category, identified in Table 13, indicate how the Service would protect the refuge's wilderness values.

Prescribed burning - The Service has not initiated any prescribed burning or other habitat improvement projects on the refuge. A prescribed burning

plan has been prepared by the refuge staff and has been approved for implementation on the refuge. This plan identifies four proposed sites for burning (on a biannual schedule), although no burning projects have yet been initiated. For purposes of analyzing the effects of wilderness designation it is assumed that this prescribed burning plan will be implemented.

Commercial timber harvest - Under Alternative A the Service would manage all refuge lands under the minimal management category. Commercial timber harvest would not be permitted on the refuge under this management category.

Mining - A limited number of mining claims are located on the refuge. No new mining claims can be filed as Section 304(c) of ANILCA withdrew public lands within National Wildlife Refuges in Alaska from entry and patent under the mining laws. Only limited mining activity is presently occurring on these claims. Work consists primarily of the assessment work required by the Mining Law of 1872 in order to maintain the validity of the mining claim. For purposes of analyzing the effects of wilderness designation it is assumed in this alternative that mining activities would remain at current levels during the next 50 years.

Oil and gas exploration, leasing, and development - With all refuge lands under minimal management, Alternative A would not allow oil and gas leasing on the refuge at this time. Oil and gas exploration, including seismic, may be allowed throughout the refuge where site-specific stipulations can be designed to ensure compatibility with refuge purposes and consistency with management objectives set forth in the CCP. All oil and gas studies would be subject to reasonable regulations to minimize impacts to fish and wildlife populations and habitats and subsistence activities. To analyze the effects of wilderness designation, a scenario of potential oil and gas exploration activities is presented in the Environmental Consequences chapter.

MANAGEMENT COSTS

In fiscal year (FY) 1985 the Yukon Flats Refuge had an operations and maintenance budget of $335,000 with a full time staff of five. An additional $80,000 was spent on fisheries related tasks utilizing two addition staff people (from the fisheries staff in Fairbanks). To fully implement the common management directions (e.g., research, monitoring, increased law enforcement, education) and management directions in Alternative A would require a 30 percent increase over the existing operations and maintenance budget for the refuge and two additional staff positions, primarily for additional monitoring, biological work, and public information and education work.

ALTERNATIVE B

Alternative B would permit the highest level of economic development and habitat improvement of the five alternatives considered. Oil and gas studies would be permitted throughout the refuge and leasing and associated activities may be allowed on 68 percent of the refuge, an area which encompasses most of the refuge identified as having moderate potential for oil and gas, where site-specific stipulations can be designed to ensure compatibility with refuge purposes and consistency with management objectives set forth in the CCP. Habitat improvement, including mechanical manipulation and water impoundments and diversions (intensive and moderate) and prescribed burning (refuge-wide), could occur. Fish and wildlife populations and habitats could be altered as a result of increased development and habitat improvement activities allowed under this alternative, although stipulations and mitigation measures would be employed to minimize impacts. Recreational use of the refuge would also be encouraged, with areas of the refuge open for development of public use facilities if the demand exists. Subsistence opportunities, though generally maintained throughout the refuge, could be altered by the increased economic and recreational use occurring in some areas of the refuge. No proposal for designating areas of the refuge as wilderness would be made.

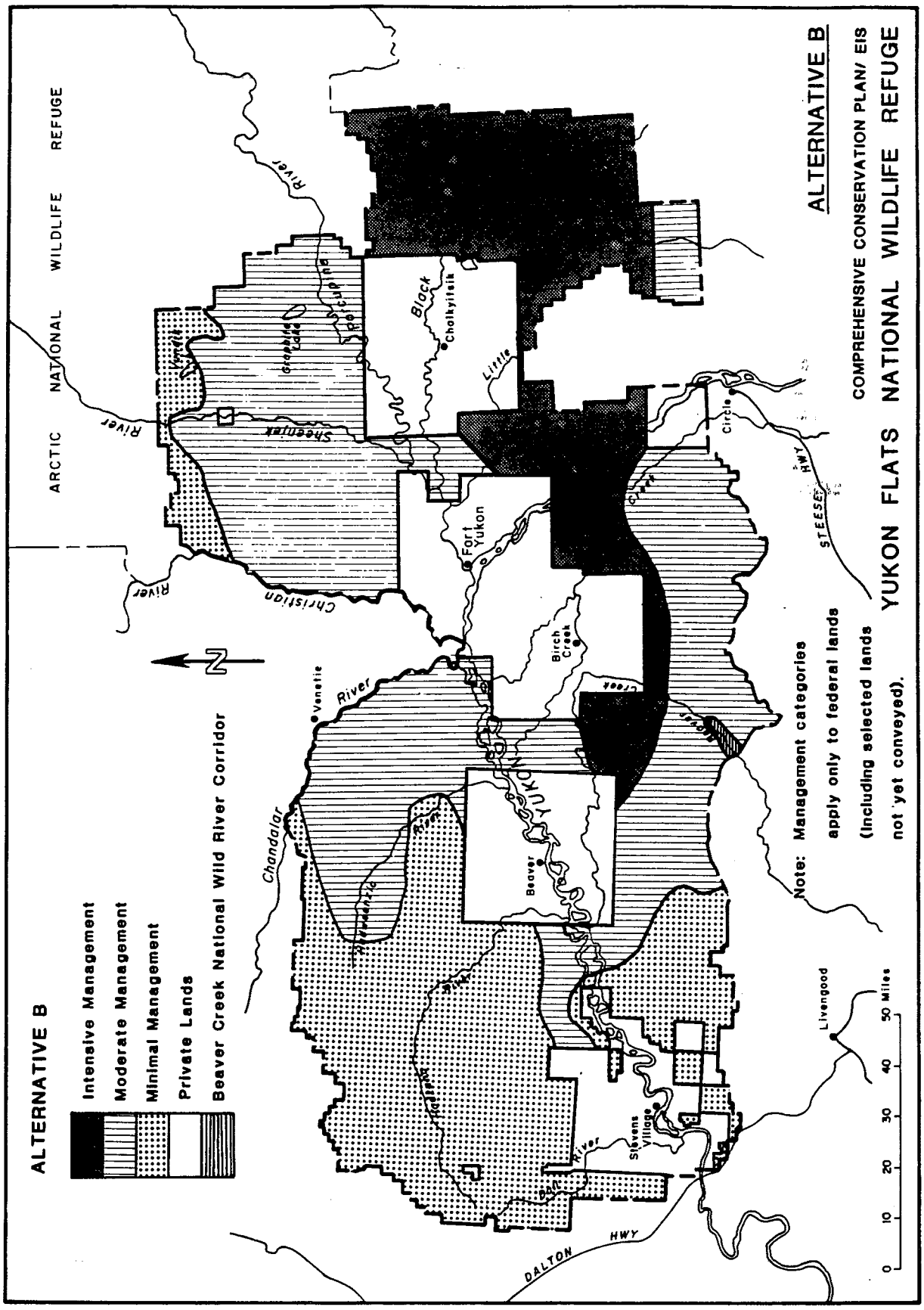
In this alternative, all refuge lands would be placed in one of three management categories - intensive, moderate, or minimal management. The distribution of the management categories in Alternative B is shown in Figure 26; Table 15 includes the acreages by management category. Table 13 lists the types of resource management activities, public uses, and economic uses that would be permitted in each management category. Two areas of the refuge would be designated for intensive management - an area south of the communities of Birch Creek and Fort Yukon and an area encompassing most of the Black River country south and east of Chalkyitsik. About 22 percent of the refuge would be in intensive management.

Moderate management would be the designation for most of the remaining land included in the area identified as having a moderate geologic potential for oil and gas (Banet 1987). This area extends from the Porcupine-Kaltag fault north of the Yukon and Porcupine rivers southward into the uplands adjacent to the White-Crazy Mountains and includes the remainder of the Black River country. This category includes 46 percent of the refuge.

Table 15. Acreage distribution by management category -- Alternative B.

Management Category	Acreage	Percentage of Refuge
Intensive Management	1,880,000	22%
Moderate Management	3,910,000	46%
Minimal Management	2,690,000	32%
TOTAL	8,480,000	100%
Proposed for Wilderness Designation	0	0

Figure 26. Alternative B.



Approximately 32 percent of the refuge, much of it in the Hodzana Highlands, would remain under minimal management in this alternative. These areas would continue to receive a high level of protection in this alternative.

Alternative B shares the following management directions with Alternative A (the Current Situation). Alternative B would:

- maintain much of the refuge in a basically undeveloped state;
- emphasize the maintenance of the refuge's natural diversity and key fish and wildlife populations and habitats;
- maintain traditional access opportunities;
- provide opportunities for continued subsistence use of refuge resources;
- maintain opportunities for hunting, fishing, and other recreational activities;
- permit the continuation of current economic activities;
- maintain current management of the Beaver Creek National Wild River (as per approved management plan); and
- propose no areas of the refuge for wilderness designation.

The following management directions indicate the major differences between Alternative B and Alternative A. Alternative B would:

- provide opportunities for oil and gas leasing and development, if compatible with refuge purposes, on approximately 68 percent of refuge (1,880,000 acres in intensive and 3,910,000 acres in moderate management);
- provide opportunities for habitat improvement activities (other than prescribed burning) on approximately 68 percent of the refuge; and
- provide opportunities for commercial timber harvest on approximately 68 percent of the refuge.

FISH AND WILDLIFE MANAGEMENT

Alternative B would require the Service to devote more attention to regulating and monitoring development activities and uses on the refuge. The Service would manage economic and public uses, including oil and gas development and associated facilities, to minimize impacts to fish and wildlife populations and habitats in areas of the refuge designated for intensive management (22 percent of the refuge) and moderate management (46 percent of the refuge). Maximum protection of the natural diversity of fish and wildlife species and habitats would be provided in areas of the refuge identified for minimal management (32 percent). Impact of development on wetlands and the waterfowl populations they support would be minimized. Management of hunting, fishing, and trapping would be the primary means of maintaining or increasing fish and wildlife populations on the refuge. Prescribed burning and minor habitat improvement activities, such as use of nesting devices and removal of beaver dams, could occur throughout the refuge. Other habitat improvement techniques, such as mechanical manipulation and water impoundments and diversions, could occur in areas of the refuge under intensive and moderate management. Numerous techniques for restoration and enhancement of fish populations may be allowed on the refuge (including hatcheries, physical and chemical habitat modification, and supplemental fish production). No plans exist to utilize any of these techniques except prescribed burning in the foreseeable future. The common management directions provide the basis for fish and wildlife management under this alternative and Table 13 identifies

management actions which may occur. For purposes of impact analysis a scenario of potential prescribed burning activities on the refuge is presented in the Environmental Consequences chapter.

MANAGEMENT OF OTHER REFUGE RESOURCES

All activities allowed on the refuge under Alternative B will comply with pollution control standards set by the Clean Water Act, the Federal Water Pollution control Act Amendments, Alaska water quality standards, the Clean Air Act as amended, and all other applicable state and federal laws and regulations governing water and air quality (see Refuge Manual 5 RM 11). The Service will cooperate with the Alaska Department of Environmental Conservation and other appropriate agencies responsible for establishing and enforcing water and air quality standards. The Common Management section of this chapter provides additional details on water and air quality management.

The Service will identify and quantify the specific water resource requirements necessary to meet the primary purposes of the refuge (Federal Reserved Water Rights). For additional details see water rights in the Common Management section of this chapter.

The maintenance of scenic values will be considered when undertaking management activities or permitting public and economic uses of the refuge. The Service will cooperate with state agencies to prevent any significant deterioration of visual resources on the refuge.

Known historic, archeological, paleontological, and cultural resources on the refuge will be protected and managed in accordance with federal and state law. Site-specific inventories will be conducted prior to the initiation of activities which may result in alteration to structures or ground disturbance. If cultural resources are found, they will be evaluated for significance and a decision on appropriate action will be made. Inventory and evaluation of cultural resources on the refuge will continue as funding permits. See cultural/historic resources discussion in the Common Management Directions for additional discussion.

A fire management plan which encompasses the refuge, the Upper Yukon-Tanana Fire Management Plan, has been prepared and approved, as has a refuge fire management plan. This plan designates levels of suppression throughout the planning area. Levels of suppression efforts are commensurate with the value of resources warranting protection. Fires will generally be allowed to burn naturally where not endangering life or property. If fire suppression is necessary, state of the art techniques and the "minimum appropriate tool" concept will be utilized. Private lands within or adjacent to the refuge and special value refuge land receive the maximum protection practicable from fire. The effects of wildfire on refuge wildlife populations and habitats will be closely monitored and will be subject to ongoing research.

SUBSISTENCE MANAGEMENT

Subsistence activities would be managed as described in the common management directions and as indicated in Table 13. Existing subsistence opportunities would be maintained in areas of the refuge under minimal management (32 percent of the refuge). In areas of the refuge under moderate management (46 percent) and intensive management (22 percent) the Service would monitor and regulate habitat improvement activities, the construction of new facilities, increased motorized access, oil and gas studies and leasing

activities, and other public and economic uses (wherever permitted) to ensure that potential conflicts with subsistence activities would be minimized.

ECONOMIC USE MANAGEMENT

Oil and Gas Exploration, Leasing, and Development. Oil and gas studies, including seismic activities, may be allowed throughout the refuge as in Alternative A. Oil and gas leasing, development, and associated support facilities may be allowed on a site-specific basis on the 68 percent of the refuge in intensive and moderate management, subject to a BLM assessment of potential, a national interest determination, and a final compatibility determination. Studies and leasing activities may be allowed on the refuge only if site-specific stipulations can be designed to ensure compatibility with refuge purposes and consistency with management objectives set forth in the CCP. All studies and leasing activities would be subject to reasonable regulations to minimize impacts to fish and wildlife populations and habitats and to subsistence activities. Common management directions and Table 13 provide additional details on oil and gas management. For purposes of impact analysis a scenario of potential oil and gas exploration, leasing, and development activities is presented in the Environmental Consequences chapter.

Mineral Development. A limited number of mining claims are located on the refuge. No new mining claims can be filed as Section 304(c) of ANILCA withdrew public lands within National Wildlife Refuges in Alaska from entry and patent under the mining laws. Hardrock mining activities, however, may increase above current levels if claims are patented. The Service would request a plan of mining operation, including mitigation measures and a rehabilitation plan, for each claim or patent holder within the refuge boundary. Impacts associated with mining would be mitigated in accordance with Service regulations. See Locatable Hardrock Minerals in the Common Management Directions section of this chapter for additional detail. For purposes of impact analysis a scenario of potential mining activities on the refuge under this alternative is presented in the Environmental Consequences chapter.

Commercial Timber Harvest. Commercial timber harvest on the refuge would be permitted on areas of the refuge in intensive management (22 percent of the refuge) or moderate management (46 percent). Interest in possible commercial harvest has been expressed by residents of the area. See Other Economic Uses in the Common Management Directions section of this chapter for additional detail. For purposes of impact analysis a scenario of potential commercial timber harvest activities on the refuge under this alternative is presented in the Environmental Consequences chapter.

RECREATIONAL USE AND ACCESS MANAGEMENT

In Alternative B, existing opportunities for hunting, fishing, other recreational activities, and scientific research would be maintained throughout the refuge. Recreational use of the refuge would be encouraged, although over the next several years use would be anticipated to grow by no more than 1,000 visitor use days. Permanent public facilities, such as visitor contact stations and roads, could be provided in intensively managed areas of the refuge (22 percent of the refuge). Improved campsites and administrative cabins could be developed throughout the refuge if necessary to prevent resource degradation or for purposes of public health and safety.

Because of the potential for increased motorized access and new public facilities in areas of intensive management, opportunities for hunting, fishing, and other recreational uses could increase.

Reasonable access to the refuge is permitted and managed as prescribed in Title XI of ANILCA and Service regulations (50 CFR 36). Use of snowmachines (during periods of adequate snow cover), motorboats, airplanes, and non-motorized surface transportation methods is allowed for participation in traditional activities and for travel to and from villages and homesites. Adequate and feasible access for economic and other purposes is guaranteed to the State and owners of private lands and to holders of valid occupancy rights in or effectively surrounded by refuge lands. Reasonable access on to the refuge is permitted and managed so visitors can participate in fish and wildlife-oriented recreational activities. Use of off-road vehicles (except on designated routes or in designated areas), air boats, and air-cushion boats is not permitted. Use of helicopters is permitted only with issuance of a special use permit. The common management directions and Table 13 provide additional detail on how public use and access would be managed in this alternative.

WILDERNESS REVIEW

In Alternative B, approximately 2.7 million acres would be placed in the minimal management category. Management would be directed at maintaining the pristine nature, fish and wildlife values, and wilderness values of these areas. The Service would maintain the existing wilderness qualities of these lands. No refuge lands would be proposed for designation as wilderness in Alternative B.

Wilderness Management Actions. Alternative B would propose no refuge lands for wilderness designation. The only issue of environmental concern under Alternative B is the impact of current and projected management actions on wilderness values. Future levels of use and activities occurring on refuge lands are projected in the scenario for this alternative presented in the Environmental Consequences chapter.

Wilderness values - Under Alternative B the Service would manage all refuge lands in non-wilderness categories (intensive, moderate, and minimal management). The management actions under these categories, identified in Table 13, indicate how the Service would protect the refuge's wilderness values.

Prescribed burning - Prescribed burning activities would be permitted in all management categories, including designated wilderness. Other habitat improvement techniques could also be undertaken in areas of the refuge under intensive and moderate management. However, prescribed burning is the most feasible technique for habitat improvement on the refuge. For purposes of analyzing effects to wilderness values a scenario of potential prescribed burning activities on the refuge has been prepared for Alternative B which incorporates the already approved prescribed burning plan for the refuge and discusses activities 50 years into the future.

Commercial timber harvest - Commercial timber harvest activities would be permitted in areas of the refuge under intensive and moderate management. Under Alternative B, a scenario of potential commercial timber harvest on the

refuge has been developed in order to allow for the analysis of impacts to wilderness values which could result from harvest activities.

Mining - Although the number of mining claims on the refuge is limited, it is possible that one or more of these claims could be patented in the future with mining activity increasing above current levels. For purposes of analyzing impacts to wilderness values, a possible scenario of mining activities has been developed for Alternative B.

Oil and gas exploration, leasing, and development - Oil and gas studies, including seismic activities, may be allowed throughout the refuge. Oil and gas leasing, development, and associated support facilities may be allowed on a site-specific basis on the 68 percent of the refuge in intensive and moderate management, subject to a BLM assessment of potential, a national interest determination, and a final compatibility determination. Studies and leasing activities may be allowed on the refuge only if site-specific stipulations can be designed to ensure compatibility with refuge purposes and consistency with management objectives set forth in the CCP. For purposes of analysis of impacts to wilderness values a scenario of potential oil and gas exploration, leasing, and development activities under Alternative B is presented in the Environmental Consequences chapter.

MANAGEMENT COSTS

Alternative B would require five additional full time staff positions above the current staffing level for the refuge. The additional staff would be needed to adequately monitor and manage economic development and increasing public use of the refuge in addition to providing additional biological and public information and education needs. This would require an 80 percent increase in the current operations and maintenance budget. Four additional staff positions and a 350 percent increase in the fisheries budget would be required to purchase equipment and provide adequate staffing to monitor the increased economic and public use on the refuge under this alternative.

ALTERNATIVE C

Alternative C emphasizes the protection of fish and wildlife populations and habitats in their present state on the refuge, but would provide for a limited amount of development activity to occur on the refuge. Oil and gas studies, including seismic activities, may be allowed throughout the refuge and oil and gas leasing may be allowed on an area of the refuge encompassing the central portion of the Yukon oil and gas basin (26 percent of the refuge) where site-specific stipulations can be designed to ensure compatibility with refuge purposes and consistency with management objectives set forth in the CCP. Habitat improvement techniques, including mechanical and water level manipulation, could occur on areas of the refuge under moderate management. A significant portion of the refuge would be managed in the minimal management category, but none of the refuge would be recommended for designation as wilderness. Subsistence harvest opportunities would be maintained throughout the refuge, as would recreational opportunities.

In Alternative C, refuge lands would be placed in either of two management categories - moderate management or minimal management. Figure 27 depicts the

Figure 27. Alternative C.

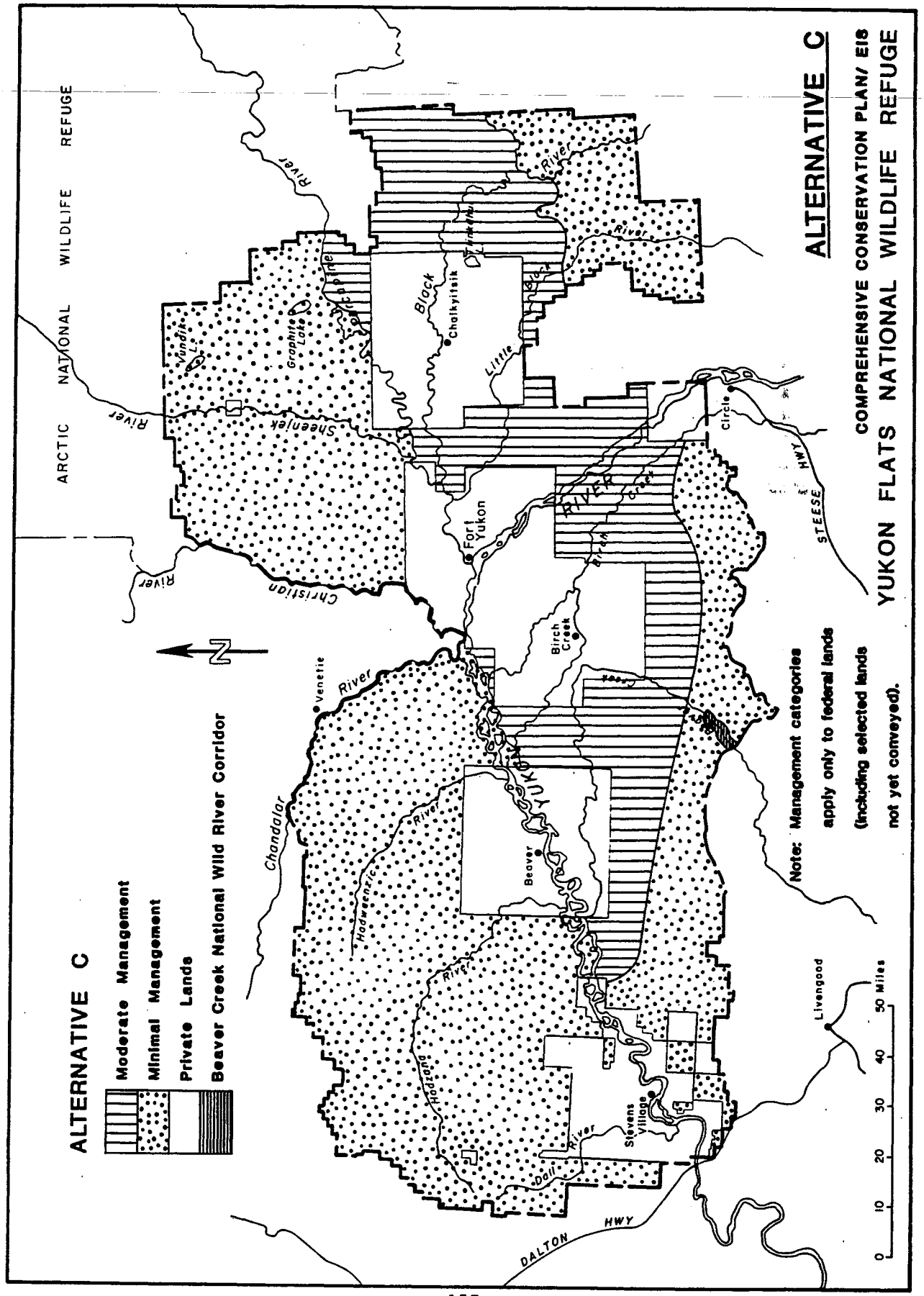


Table 16. Acreage distribution by management category -- Alternative C.

Management Category	Acreage	Percentage of Refuge
Intensive Management	0	0
Moderate Management	2,240,000	26%
Minimal Management	6,240,000	74%
TOTAL	8,480,000	100%
Proposed for Wilderness Designation	0	0

distribution of these categories in Alternative C; Table 16 identifies the acreage in each management category. Table 13 lists the types of resource management activities, public uses, and economic uses that would be permitted in each management category. The moderate management category, which accounts for 26 percent of the refuge, encompasses the central portion of the Yukon oil and gas basin (from the south bank of the Yukon and Porcupine rivers southward into the upland area - to approximately the 1,000 foot elevation line). The remainder of the refuge (74 percent) would be managed under the minimal category. A significant area of the refuge, therefore, would continue to receive a high level of protection in this alternative.

Alternative C shares the following management directions with Alternative A (the Current Situation). Alternative C would:

- maintain much of the refuge in a basically undeveloped state;
- emphasize the maintenance of the refuge's natural diversity and key fish and wildlife populations and habitats;
- maintain traditional access opportunities;
- provide opportunities for continued subsistence use of refuge resources;
- maintain opportunities for hunting, fishing, and other recreational activities;
- permit the continuation of current economic activities;
- maintain current management of the Beaver Creek National Wild River (as per approved management plan); and
- propose no areas of the refuge for wilderness designation.

The following management directions indicate the major differences between Alternative C and Alternative A. Alternative C would:

- provide opportunities for oil and gas leasing and development, if compatible with refuge purposes, on approximately 26 percent of refuge (approximately 2,240,000 acres in moderate management);
- provide opportunities for habitat improvement (other than prescribed burning) on approximately 26 percent of the refuge; and
- provide opportunities for commercial timber harvest on approximately 26 percent of the refuge.

FISH AND WILDLIFE MANAGEMENT

In Alternative C, the Service would continue to maximize protection of the natural diversity of fish and wildlife populations and habitats in their naturally occurring states on those areas of the refuge in minimal management (74 percent). Maintenance of the natural diversity of fish and wildlife populations and habitats would be sought in the remainder of the refuge through reasonable regulation of oil and gas studies and leasing activities and other permitted activities. Wetlands and the waterfowl populations they support would be protected. Management of hunting, fishing, and trapping would be the primary means of maintaining or increasing fish and wildlife populations on the refuge. Prescribed burning and minor habitat improvement activities, such as use of nesting devices and removal of beaver dams, could occur throughout the refuge. Other habitat improvement techniques, such as mechanical manipulation and water impoundments and diversions, could occur in areas of the refuge under intensive and moderate management. Numerous techniques for restoration and enhancement of fish populations may be allowed on the refuge (including hatcheries, physical and chemical habitat modification, and supplemental fish production). No plans exist to utilize any of these techniques except prescribed burning in the foreseeable future. The common management directions provide the basis for fish and wildlife management under this alternative and Table 13 identifies management actions which may occur. For purposes of impact analysis a scenario of potential prescribed burning activities on the refuge is presented in the Environmental Consequences chapter.

MANAGEMENT OF OTHER REFUGE RESOURCES

All activities allowed on the refuge under Alternative C will comply with pollution control standards set by the Clean Water Act, the Federal Water Pollution control Act Amendments, Alaska water quality standards, the Clean Air Act as amended, and all other applicable state and federal laws and regulations governing water and air quality (see Refuge Manual 5 RM 11). The Service will cooperate with the Alaska Department of Environmental Conservation and other appropriate agencies responsible for establishing and enforcing water and air quality standards. The Common Management section of this chapter provides additional details on water and air quality management.

The Service will identify and quantify the specific water resource requirements necessary to meet the primary purposes of the refuge (Federal Reserved Water Rights). For additional details see water rights in the Common Management section of this chapter.

The maintenance of scenic values will be considered when undertaking management activities or permitting public and economic uses of the refuge. The Service will cooperate with state agencies to prevent any significant deterioration of visual resources on the refuge.

Known historic, archeological, paleontological, and cultural resources on the refuge will be protected and managed in accordance with federal and state law. Site-specific inventories will be conducted prior to the initiation of activities which may result in alteration to structures or ground disturbance. If cultural resources are found, they will be evaluated for significance and a decision on appropriate action will be made. Inventory and evaluation of cultural resources on the refuge will continue as funding permits. See cultural/historic resources discussion in the Common Management Directions for additional discussion.

A fire management plan which encompasses the refuge, the Upper Yukon-Tanana Fire Management Plan, has been prepared and approved, as has a refuge fire management plan. This plan designates levels of suppression throughout the planning area. Levels of suppression efforts are commensurate with the value of resources warranting protection. Fires will generally be allowed to burn naturally where not endangering life or property. If fire suppression is necessary, state of the art techniques and the "minimum appropriate tool" concept will be utilized. Private lands within or adjacent to the refuge and special value refuge land receive the maximum protection practicable from fire. The effects of wildfire on refuge wildlife populations and habitats will be closely monitored and will be subject to ongoing research.

SUBSISTENCE MANAGEMENT

Management of subsistence activities would be as described in the common management directions and as indicated in Table 13. Existing subsistence opportunities would be maintained in areas of the refuge in minimal management (74 percent of the refuge). The Service would monitor and regulate oil and gas studies and leasing activities and all other uses in areas of moderate management (26 percent of the refuge) to minimize impacts on subsistence harvest in these areas of the refuge.

ECONOMIC USE MANAGEMENT

Oil and Gas Exploration, Leasing, and Development. Oil and gas studies, including seismic activities, may be allowed throughout the refuge as in Alternative A. Oil and gas leasing, development, and associated support facilities may be allowed on a site-specific basis on the 26 percent of the refuge in moderate management, subject to a BLM assessment of potential, a national interest determination, and a determination of compatibility. Studies and leasing activities may be allowed on the refuge only if site-specific stipulations can be designed to ensure compatibility with refuge purposes and consistency with management objectives set forth in the CCP. All studies and leasing activities would be subject to reasonable regulations to minimize impacts to fish and wildlife populations and habitats and to subsistence activities. The common management directions and Table 13 provide additional detail on oil and gas management. For purposes of impact analysis a scenario of potential oil and gas exploration, leasing, and development activities is presented in the Environmental Consequences chapter.

Mineral Development. A limited number of mining claims are located on the refuge. No new mining claims can be filed as Section 304(c) of ANILCA withdrew public lands within National Wildlife Refuges in Alaska from entry and patent under the mining laws. Hardrock mining activities, however, may increase above current levels if claims are patented. The Service would request a plan of mining operation, including mitigation measures and a rehabilitation plan, for each claim or patent holder within the refuge boundary. Impacts associated with mining would be mitigated in accordance with Service regulations. See Locatable Hardrock Minerals in the Common Management Directions section of this chapter for additional detail. For purposes of impact analysis a scenario of potential mining activities on the refuge under this alternative is presented in the Environmental Consequences chapter.

Commercial Timber Harvest. Commercial timber harvest on the refuge would be permitted on areas of the refuge in moderate management (26 percent of the refuge). Interest in possible commercial harvest has been expressed by residents of the area. See Other Economic Uses in the Common Management Directions section of this chapter for additional detail. For purposes of impact analysis a scenario of potential commercial timber harvest activities on the refuge under this alternative is presented in the Environmental Consequences chapter.

RECREATIONAL USE AND ACCESS MANAGEMENT

In Alternative C, existing opportunities for hunting, fishing, and other recreational uses would be maintained, as would opportunities for scientific research. The number of non-local users participating in recreational activities on the refuge is low (less than 1,000 visitor days per year). Increased recreational use would occur, although over the next several years use would be anticipated to grow by no more than 500 visitor use days. Improved campsites and administrative cabins could be developed throughout the refuge if necessary to prevent resource degradation or for purposes of public health and safety.

Reasonable access to the refuge is permitted and managed as prescribed in Title XI of ANILCA and Service regulations (50 CFR 36). Use of snowmachines (during adequate snow cover), motorboats, airplanes, and non-motorized surface transportation methods is allowed for participation in traditional activities and for travel to and from villages and homesites. Adequate and feasible access for economic and other purposes is guaranteed to the State and owners of private lands and to holders of valid occupancy rights in or effectively surrounded by refuge lands. Reasonable access on to the refuge is permitted and managed so visitors can participate in fish and wildlife-oriented recreational activities. Use of off-road vehicles (except on designated routes or in designated areas), air boats, and air-cushion boats is not permitted. Use of helicopters is permitted only with issuance of a special use permit. The common management directions and Table 13 provide additional detail on how public use and access would be managed in this alternative.

WILDERNESS REVIEW

Approximately 6.24 million acres would be under the minimal management category. Management would be directed at maintaining the pristine nature, fish and wildlife values, and wilderness values of these areas. The Service would maintain the existing wilderness qualities of these lands. No refuge lands would be proposed for designation as wilderness.

Wilderness Management Actions. Alternative C would propose no refuge lands for wilderness designation. The only issue of environmental concern under Alternative B is the impact of current and projected management actions on wilderness values. Future levels of use and activities occurring on refuge lands are projected in the scenario for this alternative presented in the Environmental Consequences chapter.

Wilderness values - Under Alternative C the Service would manage all refuge lands in non-wilderness categories (moderate and minimal management). The management actions under these categories, identified in Table 13, indicate how the Service would protect the refuge's wilderness values.

Prescribed burning - Prescribed burning activities would be permitted in all management categories, including designated wilderness. Other habitat improvement techniques could also be undertaken in areas of the refuge under moderate management. However, prescribed burning is the most feasible technique for habitat improvement on the refuge. For purposes of analyzing impacts to wilderness values a scenario of potential prescribed burning activities on the refuge has been prepared for Alternative C which incorporates the already approved prescribed burning plan for the refuge and discusses activities 50 years into the future.

Commercial timber harvest - Commercial timber harvest activities would be permitted in areas of the refuge under moderate management. Under Alternative C, a scenario of potential commercial timber harvest on the refuge has been developed in order to allow for analysis of impacts to wilderness values which could result from harvest activities.

Mining - Although the number of mining claims on the refuge is limited, it is possible that one or more of these claims could be patented in the future with mining activity increasing above current levels. For purposes of analyzing impacts to wilderness values, a potential mining scenario has been developed for Alternative C.

Oil and gas exploration, leasing, and development - Oil and gas studies, including seismic activities, may be allowed throughout the refuge. Oil and gas leasing, development, and associated support facilities may be allowed on a site-specific basis on the 26 percent of the refuge in moderate management, subject to a BLM assessment of potential, a national interest determination, and a final compatibility determination. Studies and leasing activities may be allowed on the refuge only if site-specific stipulations can be designed to ensure compatibility with refuge purposes and consistency with management objectives set forth in the CCP. For purposes of analyzing impacts to wilderness values a scenario of potential oil and gas exploration, leasing, and development activities on the refuge under Alternative C is presented in the Environmental Consequences chapter.

MANAGEMENT COSTS

Alternative C would require four additional full time staff positions above the current staffing level for the refuge. The additional staff would be needed to adequately monitor and manage oil and gas studies and leasing, to provide additional enforcement, and to provide additional biological and public information and education needs. This would require a 65 percent increase in the current operations and maintenance budget. Two additional staff positions and a 200 percent increase in the fisheries budget would be required to purchase equipment and provide adequate staffing to monitor the increased activities on the refuge under this alternative.

ALTERNATIVE D
The Preferred Alternative

Alternative D would maintain the existing range and intensity of management and recreational and economic uses on the Yukon Flats Refuge. As in Alternative A, it is assumed that existing laws, executive orders, regulations, and policies governing Service administration and operation of the National Wildlife Refuge System would remain in effect.

Under this alternative, all refuge lands would be placed in the minimal management category as depicted in Figure 28 and Table 17. This category would provide for maximum protection of the natural diversity of fish and wildlife populations and habitats that occur on the refuge. Disturbance of fish and wildlife habitats and populations would be minimized. Public and economic uses of the refuge would continue to be allowed using existing access methods. Opportunities for hunting, fishing, and other recreational use, for subsistence resource harvest, and for scientific research would be maintained. No oil and gas leasing would be allowed on the refuge now, although oil and gas studies, including seismic, would be allowed where site-specific stipulations can be designed to ensure compatibility with refuge purposes and consistency with management objectives set forth in the CCP. Table 13 identifies the resource management activities, economic uses, and public uses which would be permitted under this management strategy.

The pristine conditions and fish and wildlife values found on the refuge would be maintained. The minimal management category provides the basis for the Service's recommendation for future designation as wilderness. Under Alternative D, eight percent of the refuge (in the White-Crazy mountains) would be recommended for wilderness designation and could receive the added protection of management under the Wilderness Act.

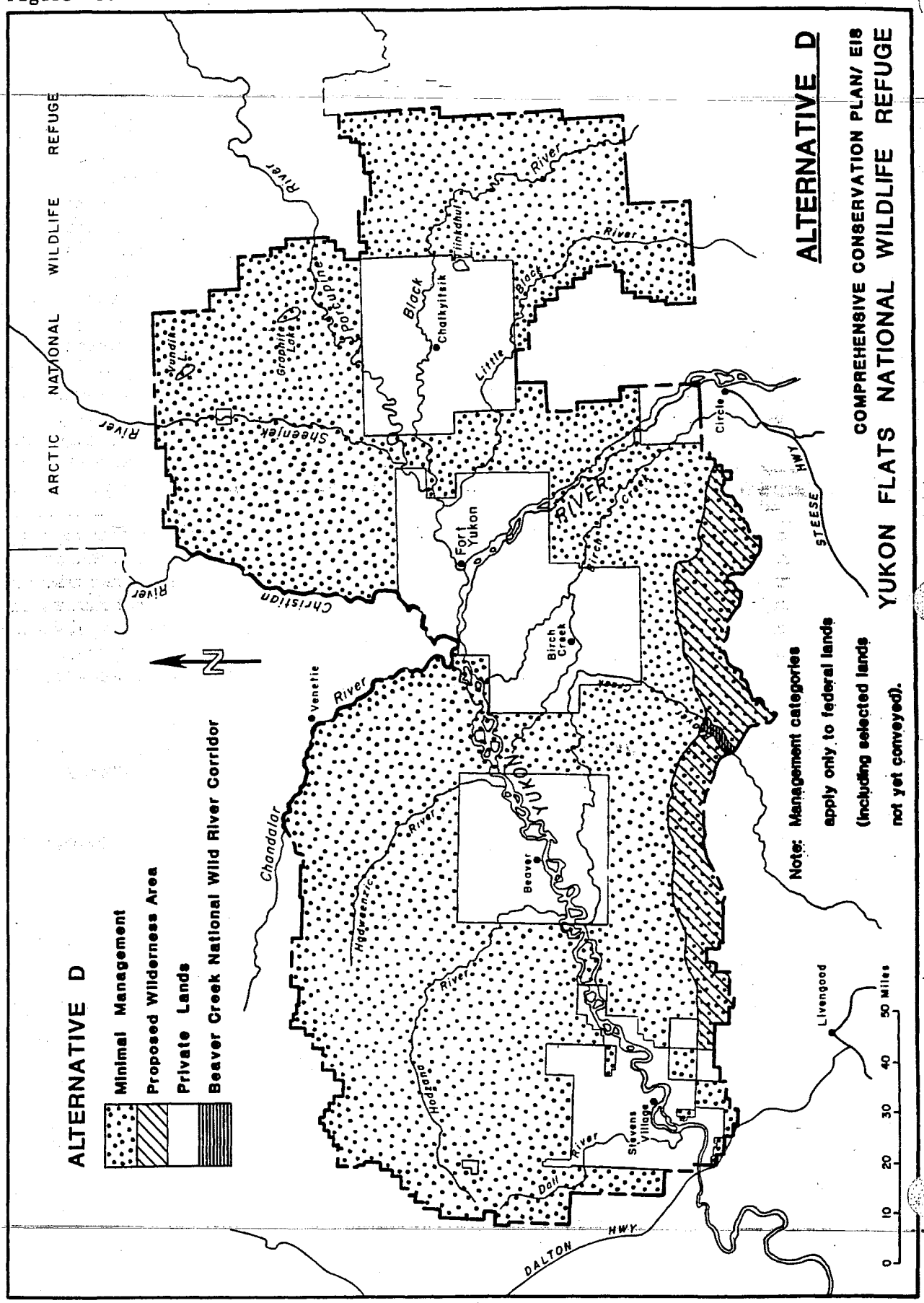
Alternative D shares the following management directions with Alternative A (the Current Situation). Alternative D would:

- maintain the refuge in a basically undeveloped state;
- emphasize the maintenance of the refuge's natural diversity and key fish and wildlife populations and habitats;
- maintain traditional access opportunities;
- provide opportunities for continued subsistence use of refuge resources;

Table 17. Acreage distribution by management category -- Alternative D.

Management Category	Acreage	Percentage of Refuge
Intensive Management	0	0
Moderate Management	0	0
Minimal Management	8,480,000	100%
TOTAL	8,480,000	100%
Proposed for Wilderness Designation	650,000	8%

Figure 28. Alternative D.



- maintain opportunities for hunting, fishing, and other recreational activities;
- permit the continuation of current economic activities; and
- maintain current management of the Beaver Creek National Wild River (as per approved management plan).

The following management directions indicate the major differences between Alternative D and Alternative A. Alternative D would:

- propose the White-Crazy Mountains along the refuges southern boundary for wilderness designation (8 percent of the refuge - 650,000 acres).

FISH AND WILDLIFE MANAGEMENT

In Alternative D, the Service would emphasize maintenance of, to the maximum extent possible, the natural diversity of fish and wildlife populations and habitats on the refuge and minimizing the impacts of management activities and public and economic uses on these populations and habitats. In particular, emphasis would be placed on maximizing protection of wetlands and the waterfowl habitat they support. Management of hunting, fishing, and trapping would be the primary means of maintaining or increasing fish and wildlife populations on the refuge. Prescribed burning and minor habitat improvement techniques such as use of nesting devices and removal of beaver dams are the only habitat improvement techniques which could be undertaken to improve habitat conditions under this alternative. Mechanical manipulation and water impoundments and diversions would not be permitted under this management alternative. A number of techniques for restoration and enhancement of fish populations may be allowed on the refuge (including hatcheries, physical and chemical habitat modification, and supplemental fish production), although permanent facilities for enhancement purposes would not be permitted in designated wilderness. No plans exist to utilize any of these techniques except prescribed burning in the foreseeable future. The common management directions provide a basis for fish and wildlife management and Table 13 gives additional detail on fish and wildlife management activities. For purposes of impact analysis a scenario of potential prescribed burning activities on the refuge is presented in the Environmental Consequences chapter.

MANAGEMENT OF OTHER REFUGE RESOURCES

All activities allowed on the refuge under Alternative D will comply with pollution control standards set by the Clean Water Act, the Federal Water Pollution Control Act Amendments, Alaska water quality standards, the Clean Air Act as amended, and all other applicable state and federal laws and regulations governing water and air quality (see Refuge Manual 5 RM 11). The Service will cooperate with the Alaska Department of Environmental Conservation and other appropriate agencies responsible for establishing and enforcing water and air quality standards. The Common Management section of this chapter provides additional details on water and air quality management.

The Service will identify and quantify the specific water resource requirements necessary to meet the primary purposes of the refuge (Federal Reserved Water Rights). For additional details see water rights in the Common Management section of this chapter.

The maintenance of scenic values will be considered when undertaking management activities or permitting public and economic uses of the refuge. The Service will cooperate with state agencies to prevent any significant deterioration of visual resources on the refuge.

Known historic, archeological, paleontological, and cultural resources on the refuge will be protected and managed in accordance with federal and state law. Site-specific inventories will be conducted prior to the initiation of activities which may result in alteration to structures or ground disturbance. If cultural resources are found, they will be evaluated for significance and a decision on appropriate action will be made. Inventory and evaluation of cultural resources on the refuge will continue as funding permits. See cultural/historic resources discussion in the Common Management Directions for additional discussion.

A fire management plan which encompasses the refuge, the Upper Yukon-Tanana Fire Management Plan, has been prepared and approved, as has a refuge fire management plan. This plan designates levels of suppression throughout the planning area. Levels of suppression efforts are commensurate with the value of resources warranting protection. Fires will generally be allowed to burn naturally where not endangering life or property. If fire suppression is necessary, state of the art techniques and the "minimum appropriate tool" concept will be utilized. Private lands within or adjacent to the refuge and special value refuge land receive the maximum protection practicable from fire. The effects of wildfire on refuge wildlife populations and habitats will be closely monitored and will be subject to ongoing research.

SUBSISTENCE MANAGEMENT

Existing subsistence opportunities would be maintained throughout the entire refuge. Management of subsistence activities would be as described in the common management directions and as identified in Table 13.

ECONOMIC USE MANAGEMENT

Oil and Gas Exploration, Leasing, and Development. With all refuge lands under minimal management and eight percent of the refuge proposed for wilderness designation, Alternative D would not allow oil and gas leasing on the refuge at this time. However, leasing may be allowed on some areas of the refuge in the future, subject to a BLM assessment of potential, a national interest determination, and a determination of compatibility. Any areas of the refuge designated as wilderness would be closed to oil and gas leasing. Oil and gas studies, including seismic activities, may be allowed throughout the refuge where site-specific stipulations can be designed to ensure compatibility with refuge purposes and consistency with management objectives set forth in the CCP. All oil and gas studies would be subject to reasonable regulations to minimize impacts to fish and wildlife populations and habitats and to subsistence activities. Oil and gas studies that require motorized equipment would not be allowed in areas designated as wilderness by Congress unless conducted by or for an Interior Department agency in accordance with section 1010 of ANILCA. Common management directions and Table 13 provide additional details on oil and gas management. For purposes of impact analysis a scenario of potential oil and gas exploration, leasing, and development activities is presented in the Environmental Consequences chapter.

Mineral Development. A limited number of mining claims are located on the refuge. No new mining claims can be filed as Section 304(c) of ANILCA withdrew public lands within National Wildlife Refuges in Alaska from entry and patent under the mining laws. Hardrock mining activities, however, may increase above current levels if claims are patented. The Service would request a plan of mining operation, including mitigation measures and a rehabilitation plan, for each claim or patent holder within the refuge boundary. Impacts associated with mining would be mitigated in accordance with Service regulations. See Locatable Hardrock Minerals in the Common Management Directions section of this chapter for additional detail. For purposes of impact analysis a scenario of potential mining activities on the refuge under this alternative is presented in the Environmental Consequences chapter.

Commercial Timber Harvest. Commercial timber harvest on the refuge would not be permitted under minimal management or wilderness management, the proposed management categories under Alternative D.

RECREATIONAL USE AND ACCESS MANAGEMENT

In Alternative D, existing opportunities for hunting, fishing, and other recreational uses would be maintained, as would opportunities for scientific research. The number of non-local users participating in recreational activities on the refuge is low (less than 1,000 visitor days per year). Increased recreational use would occur, although over the next several years use would be anticipated to grow by no more than 350 visitor use days. Improved campsites and administrative cabins could be developed throughout the refuge if necessary to prevent resource degradation or for purposes of public health and safety.

Reasonable access to the refuge is permitted and managed as prescribed in Title XI of ANILCA and Service regulations (50 CFR 36). Use of snowmachines (during periods of adequate snow cover), motorboats, airplanes, and non-motorized surface transportation methods is allowed for participation in traditional activities and for travel to and from villages and homesites. Adequate and feasible access for economic and other purposes is guaranteed to the State and owners of private lands and to holders of valid occupancy rights in or effectively surrounded by refuge lands. Reasonable access on to the refuge is permitted and managed so visitors can participate in fish and wildlife-oriented recreational activities. Use of off-road vehicles (except on designated routes or in designated areas), air boats, and air-cushion boats is not permitted. Use of helicopters is permitted only with issuance of a special use permit. The common management directions and Table 13 provide additional detail on how public use and access would be managed in this alternative.

WILDERNESS REVIEW

All refuge lands are suitable for designation as wilderness. In Alternative D, all refuge lands would be placed in the minimal management category. The Service would propose eight percent of the refuge lands for designation as wilderness.

This area would include the White and Little Crazy mountains. Management would be directed at maintaining the pristine nature, fish and wildlife values, and wilderness values of all lands in the refuge, but only those lands recommended for designation as wilderness would potentially receive the added

protection of management under the provisions of the Wilderness Act of 1964, as amended by ANILCA. Designation of these lands as wilderness would be dependent on the recommendation of the President and the approval of Congress.

This area includes the unique white limestone outcroppings of the White Mountains. The area is very scenic. Wildlife in the area includes Dall sheep (only population on the refuge), caribou, moose, grizzly and black bear, wolves, and lynx. This are of the refuge lies adjacent to two conservation units managed by the BLM, the White Mountains National Recreation Area (NRA) and the Steese National Conservation Area. Many of the lands within the White Mountains NRA adjacent to the proposed wilderness area have been designated as primitive. Regardless of whether the area is legally designated as wilderness, the Service would maintain the existing fish and wildlife values and wilderness qualities of all the lands in the refuge. Table 13 and common management directions provide additional detail on management of these areas.

Pursuant to Section 906(o) of ANILCA, selected lands are managed as refuge lands. The Service recognizes that the selected lands in the wilderness proposal are subject to conveyance and would be included as part to the designated wilderness only if the selection is relinquished or invalidated.

Wilderness Management Actions. The Service would manage a designated wilderness area as described in the description of the wilderness category, at the beginning of this chapter and in Table 13. Traditional means of access, subsistence use, recreational hunting and fishing, trapping, and other activities that took place before the passage of ANILCA would be permitted if they are compatible with refuge purposes as defined in ANILCA. No new permanent structures would be permitted (except for administrative purposes). Management actions that would affect wilderness values of the areas proposed for designation or other significant wilderness issues, identified in Chapter II, are referenced below.

Wilderness values - Under Alternative D, the Service would protect the refuge's wilderness values in the designated wilderness area. No special actions would be taken in the area to protect wilderness values other than those described in the description of the management categories, in Table 13, and in the common management direction for wilderness suitability. Other refuge lands would be managed under the minimal management category. The management actions under this category, identified in Table 13, indicate how the Service would protect the refuge's wilderness values.

Prescribed burning - Prescribed burning activities would be permitted in all management categories, including designated wilderness. Other habitat improvement techniques would not be allowed under minimal management or designated wilderness categories. For purposes of analyzing impacts to wilderness values a scenario of potential prescribed burning activities on the refuge has been prepared for Alternative D which incorporates the already approved prescribed burning plan for the refuge and discusses activities 50 years into the future.

Commercial timber harvest - Under Alternative D the Service would manage all refuge lands under the minimal management category and would propose approximately eight percent of the refuge for wilderness designation. Commercial timber harvest would not be permitted on the refuge under either minimal management or designated wilderness categories.

Mining - Although the number of mining claims on the refuge is limited, it is possible that one or more of these claims could be patented in the future with mining activity increasing above current levels. For purposes of analyzing impacts to wilderness values, a potential mining scenario has been developed for Alternative D.

Oil and gas exploration, leasing, and development - With all refuge lands under minimal management and eight percent of the refuge proposed for wilderness designation, Alternative D would not allow oil and gas leasing on the refuge a this time. Any area of refuge designated as wilderness would be closed to leasing and development activities. Oil and gas exploration, including seismic, may be allowed throughout the refuge where site-specific stipulations can be designed to ensure compatibility with refuge purposes and consistency with management objectives set forth in the CCP. All oil and gas studies would be subject to reasonable regulations to minimize impacts to fish and wildlife populations and habitats and subsistence activities. Oil and gas studies that require motorized equipment would not be allowed in areas designated as wilderness by Congress unless conducted by or for an Interior Department agency in accordance with section 1010 of ANILCA. For purposes of analyzing impacts on wilderness values a scenario of potential oil and gas exploration activities is presented in the Environmental Consequences chapter.

MANAGEMENT COSTS

Alternative D would require two additional full time staff positions above the current staffing level for the refuge. The increase in staff would be needed to provide additional monitoring and enforcement and to providing additional biological and public information and education support. This would require a 35 percent increase in the current operations and maintenance budget. The fisheries staff and budget would remain as in Alternative A.

ALTERNATIVE E

Alternative E would maintain the existing range and intensity of management and recreational and economic uses on the Yukon Flats Refuge. As in Alternative A, it is assumed that existing laws, executive orders, regulations, and policies governing Service administration and operation of the National Wildlife Refuge System would remain in effect.

Under this alternative, all refuge lands would be placed in the minimal management category as depicted in Figure 29 and Table 18. This alternative would provide for maximum protection of the natural diversity of fish and wildlife populations and habitats that occur on the refuge. Disturbance of fish and wildlife habitats and populations would be minimized. Public and economic uses of the refuge would continue to be allowed using existing access methods. Opportunities for hunting, fishing, and other recreational use, for subsistence harvest, and for scientific research would be maintained. If designated as wilderness, the refuge would be closed to oil and gas leasing. Oil and gas studies that require motorized equipment would not be allowed in designated wilderness except as provided for in Section 1010 of ANILCA. Table 13 identifies the resource management activities, economic uses, and public uses which would be permitted under this management strategy.

Figure 29. Alternative E.

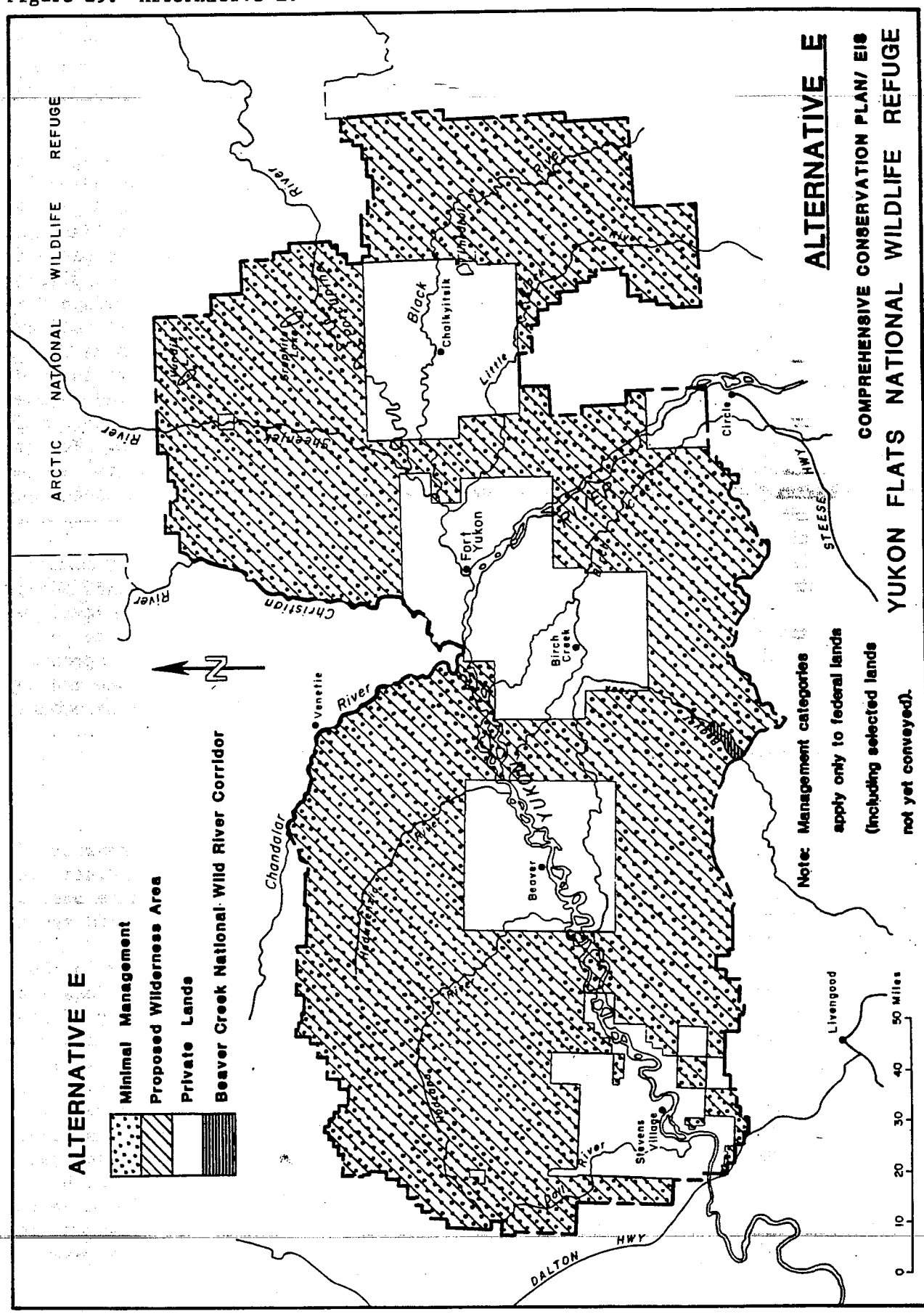


Table 18. Acreage distribution by management category -- Alternative E.

Management Category	Acreage	Percentage of Refuge
Intensive Management	0	0
Moderate Management	0	0
Minimal Management	8,480,000	100%
TOTAL	8,480,000	100%
Proposed for Wilderness Designation	8,480,000	100%

The pristine conditions and fish and wildlife values found on the refuge would be maintained. The minimal management category provides the basis for the Service's recommendation for future designation as wilderness. Under Alternative E, all of the refuge (8.48 million acres) would be recommended for wilderness designation and could receive the added protection of management under the Wilderness Act.

Alternative E shares the following management directions with Alternative A (the Current Situation). Alternative E would:

- maintain the refuge in a basically undeveloped state;
- emphasize the maintenance of the refuge's natural diversity and key fish and wildlife populations and habitats;
- maintain traditional access opportunities;
- provide opportunities for continued subsistence use of refuge resources;
- maintain opportunities for hunting, fishing, and other recreational activities;
- permit the continuation of current economic activities; and
- maintain current management of the Beaver Creek National Wild River (as per approved management plan).

The following management directions indicate the major differences between Alternative E and Alternative A. Alternative D would:

- propose all refuge lands for wilderness designation - 8.48 million acres.

FISH AND WILDLIFE MANAGEMENT

In Alternative E, the Service would emphasize maintenance of, to the maximum extent possible, the natural diversity of fish and wildlife populations and habitats on the refuge and minimizing the impacts of management activities and public and economic uses on these populations and habitats. In particular, emphasis would be placed on maximizing protection of wetlands and the waterfowl habitat they support. Management of hunting, fishing, and trapping would be the primary means of maintaining or increasing fish and wildlife populations on the refuge. Prescribed burning and minor habitat improvement activities such as construction of nesting devices and removal of beaver dams are the

only habitat improvement techniques which could be undertaken to improve habitat conditions under this alternative. Mechanical manipulation and water impoundments and diversions would not be permitted under this management alternative. A number of techniques for restoration and enhancement of fish populations may be allowed on the refuge (including hatcheries, physical and chemical habitat modification, and supplemental fish production), although permanent facilities for enhancement purposes would not be permitted in designated wilderness. No plans exist to utilize any of these techniques except prescribed burning in the foreseeable future. Common management directions provide a basis for fish and wildlife management and Table 13 gives additional detail on fish and wildlife management activities. For purposes of impact analysis a scenario of potential prescribed burning activities on the refuge is presented in the Environmental Consequences chapter.

MANAGEMENT OF OTHER REFUGE RESOURCES

All activities allowed on the refuge under Alternative E will comply with pollution control standards set by the Clean Water Act, the Federal Water Pollution Control Act Amendments, Alaska water quality standards, the Clean Air Act as amended, and all other applicable state and federal laws and regulations governing water and air quality (see Refuge Manual 5 RM 11). The Service will cooperate with the Alaska Department of Environmental Conservation and other appropriate agencies responsible for establishing and enforcing water and air quality standards. The Common Management section of this chapter provides additional details on water and air quality management.

The Service will identify and quantify the specific water resource requirements necessary to meet the primary purposes of the refuge (Federal Reserved Water Rights). For additional details see water rights in the Common Management section of this chapter.

The maintenance of scenic values will be considered when undertaking management activities or permitting public and economic uses of the refuge. The Service will cooperate with state agencies to prevent any significant deterioration of visual resources on the refuge.

Known historic, archeological, paleontological, and cultural resources on the refuge will be protected and managed in accordance with federal and state law. Site-specific inventories will be conducted prior to the initiation of activities which may result in alteration to structures or ground disturbance. If cultural resources are found, they will be evaluated for significance and a decision on appropriate action will be made. Inventory and evaluation of cultural resources on the refuge will continue as funding permits. See cultural/historic resources discussion in the Common Management Directions for additional discussion.

A fire management plan which encompasses the refuge, the Upper Yukon-Tanana Fire Management Plan, has been prepared and approved, as has a refuge fire management plan. This plan designates levels of suppression throughout the planning area. Levels of suppression efforts are commensurate with the value of resources warranting protection. Fires will generally be allowed to burn naturally where not endangering life or property. If fire suppression is necessary, state of the art techniques and the "minimum appropriate tool" concept will be utilized. Private lands within or adjacent to the refuge and special value refuge land receive the maximum protection practicable from fire. The effects of wildfire on refuge wildlife populations and habitats will be closely monitored and will be subject to ongoing research.

SUBSISTENCE MANAGEMENT

Existing subsistence opportunities would be maintained throughout the entire refuge. Management of subsistence activities would be as described in the common management directions and as identified in Table 13.

ECONOMIC USE MANAGEMENT

Oil and Gas Exploration, Leasing, and Development. With all refuge lands under minimal management, Alternative E would not allow oil and gas leasing on the refuge at this time. If designated as wilderness, the refuge would be closed to oil and gas leasing. All oil and gas studies would be subject to reasonable regulations to minimize impacts to fish and wildlife populations and habitats and to subsistence activities. Oil and gas studies that require motorized equipment would not be allowed in areas designated as wilderness by Congress unless conducted by or for an Interior Department agency in accordance with section 1010 of ANILCA. Common management directions and Table 13 provide additional details on oil and gas management. For purposes of impact analysis a scenario of potential oil and gas exploration, leasing, and development activities is presented in the Environmental Consequences chapter.

Mineral Development. A limited number of mining claims are located on the refuge. No new mining claims can be filed as Section 304(c) of ANILCA withdrew public lands within National Wildlife Refuges in Alaska from entry and patent under the mining laws. Hardrock mining activities, however, may increase above current levels if claims are patented. The Service would request a plan of mining operation, including mitigation measures and a rehabilitation plan, for each claim or patent holder within the refuge boundary. Impacts associated with mining would be mitigated in accordance with Service regulations. See Locatable Hardrock Minerals in the Common Management Directions section of this chapter for additional detail. For purposes of impact analysis a scenario of potential mining activities on the refuge under this alternative is presented in the Environmental Consequences chapter.

Commercial Timber Harvest. Commercial timber harvest on the refuge would not be permitted under minimal management or wilderness management, the proposed management categories under Alternative E.

RECREATIONAL USE AND ACCESS MANAGEMENT

In Alternative E, existing opportunities for hunting, fishing, and other recreational uses would be maintained, as would opportunities for scientific research. The number of non-local users participating in recreational activities on the refuge is low (less than 1,000 visitor days per year). Increased recreational use would occur, although over the next several years use would be anticipated to grow by no more than 500 visitor use days. Improved campsites and administrative cabins could be developed throughout the refuge if necessary to prevent resource degradation or for purposes of public health and safety.

Reasonable access to the refuge is permitted and managed as prescribed in Title XI of ANILCA and Service regulations (50 CFR 36). Use of snowmachines (during periods of adequate snow cover), motorboats, airplanes, and non-motorized surface transportation methods is allowed for participation in traditional activities and for travel to and from villages and homesites.

Adequate and feasible access for economic and other purposes is guaranteed to the State and owners of private lands and to holders of valid occupancy rights in or effectively surrounded by refuge lands. Reasonable access on to the refuge is permitted and managed so visitors can participate in fish and wildlife-oriented recreational activities. Use of off-road vehicles (except on designated routes or in designated areas), air boats, and air-cushion boats is not permitted. Use of helicopters is permitted only with issuance of a special use permit. The common management directions and Table 13 provide additional detail on how public use and access would be managed in this alternative.

WILDERNESS REVIEW

In Alternative E, all refuge lands would be placed in the minimal management category. The Service would propose all refuge lands for designation as wilderness.

Management would be directed at maintaining the pristine nature, fish and wildlife values, and wilderness values of the refuge. All refuge lands would potentially receive the added protection of management under the provisions of the Wilderness Act of 1964, as amended by ANILCA. Designation of these lands as wilderness would be dependent on the recommendation of the President and the approval of Congress. Regardless of whether the areas are legally designated as wilderness, the Service would maintain the existing fish and wildlife values and wilderness qualities of all the lands in the refuge. Table 13 and common management directions provide additional detail on management of these areas.

Pursuant to Section 906(o) of ANILCA, selected lands are managed as refuge lands. The Service recognizes that the selected lands in the wilderness proposal are subject to conveyance and would be included as part of the designated wilderness only if the selection is relinquished or invalidated.

Wilderness Management Actions. The Service would manage a designated wilderness area as described in the description of the wilderness category, at the beginning of this chapter and in Table 13. Traditional means of access, subsistence use, recreational hunting and fishing, trapping, and other activities that took place before the passage of ANILCA would be permitted if they are compatible with refuge purposes as defined in ANILCA. No new permanent structures would be permitted (except for administrative purposes).

Management actions that would affect wilderness values of the areas proposed for designation or other significant wilderness issues, identified in Chapter II, are referenced below.

Wilderness values - Under Alternative E, the Service would protect the refuge's wilderness values in any areas of the refuge designated as wilderness. No special actions would be taken to protect wilderness values other than those described in the description of the management categories, in Table 13, and in the common management direction for wilderness suitability.

Prescribed burning - Prescribed burning activities would be permitted in all management categories, including designated wilderness. Other habitat improvement techniques would not be allowed under minimal management or designated wilderness categories. For purposes of analyzing impacts to wilderness values a scenario of potential prescribed burning activities on the

refuge has been prepared for Alternative E which incorporates the already approved prescribed burning plan for the refuge and discusses activities 50 years into the future.

Commercial timber harvest - Under Alternative E the Service would manage all refuge lands under the minimal management category and would propose all refuge lands for wilderness designation. Commercial timber harvest would not be permitted on the refuge under either minimal management or designated wilderness categories.

Mining - Although the number of mining claims on the refuge is limited, it is possible that one or more of these claims could be patented in the future with mining activity increasing above current levels. For purposes of analyzing impacts to wilderness values, a potential mining scenario has been developed for Alternative E which assumes no increased mining activity.

Oil and gas exploration, leasing, and development - With all refuge lands under minimal management and all lands proposed for wilderness designation, Alternative E would not allow oil and gas leasing on the refuge at this time. Any area of the refuge designated as wilderness would be closed to leasing and development activities. Only oil and gas studies using non-motorized equipment would be permitted (unless conducted by an Interior Department agency or their contractor under Section 1010 of ANILCA) in designated wilderness areas. For purposes of analyzing impacts on wilderness values a scenario of potential oil and gas exploration activities is presented in the Environmental Consequences chapter.

MANAGEMENT COSTS

Alternative E would require two additional full time staff positions above the current staffing level for the refuge. The increase in staff would be needed to provide additional monitoring and enforcement and to providing additional biological and public information and education support. This would require a 40 percent increase in the current operations and maintenance budget. The fisheries staff and budget would remain as in Alternative A.

OTHER ALTERNATIVES CONSIDERED

Five management alternatives were developed for the Yukon Flats Refuge and are analyzed in this document. Other alternatives were considered during early stages in the planning process. Most of these alternatives fell within the range of alternatives which are evaluated in this document and would result in variations of the impacts within the range discussed in this document. Other alternatives opened more of the refuge to development of recreational facilities and economic uses. These alternatives were determined not to meet refuge purposes as outlined in ANILCA and were, therefore, not evaluated in this document.

Table 19. Comparison of the alternatives, Yukon Flats Refuge.

Management Activity	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Fish and Wildlife	High level of protection assured	With mitigation, high level of protection assured over 78% of refuge	With mitigation, high level of protection assured	High level of protection assured	High level of protection assured
Other Resources	Water and air quality standards met; water resource requirements not documented; cultural resources protected in accordance with laws	Water and air quality standards met; water resource requirements will be documented; cultural resources protected in accordance with laws	Water and air quality standards met; water resource requirements will be documented; cultural resources protected in accordance with laws	Water and air quality standards met; water resource requirements will be documented; cultural resources protected in accordance with laws	Water and air quality standards met; water resource requirements will be documented; cultural resources protected in accordance with laws
Subsistence	Continued opportunities assured	Continued opportunities assured, but increased competition for and displacement of wildlife likely	Continued opportunities assured, but increased competition for and displacement of wildlife likely	Continued opportunities assured	Continued opportunities assured
Oil and Gas	Oil and gas exploration may be allowed throughout the refuge; leasing and associated development not allowed	Exploration may be allowed throughout the refuge; leasing and associated development allowed on 68% of the refuge	Exploration may be allowed throughout the refuge; leasing and associated development allowed on 26% of the refuge	Oil and gas exploration may be allowed throughout the refuge; leasing and associated development not allowed	Oil and gas exploration may be allowed throughout the refuge; leasing and associated development not allowed
Other Economic Uses	Limited mining activities currently occurring; no commercial timber harvest allowed	Mining activity could increase; timber harvest allowed on 68% of refuge; other economic activities could occur on 22% of refuge	Mining activity could increase; timber harvest allowed on 26% of refuge	Mining activity could increase; timber harvest not allowed	Mining activity could increase; timber harvest not allowed
Recreational Use	Existing opportunities maintained	Opportunities increased; use encouraged	Existing opportunities maintained	Existing opportunities maintained	Existing opportunities maintained
Access	Existing opportunities maintained	Existing opportunities maintained; new opportunities likely	Existing opportunities maintained	Existing opportunities maintained	Existing opportunities maintained
Wilderness	100% suitable 0% proposed	57% suitable 0% proposed	74% suitable 0% proposed	100% suitable 8% proposed	100% suitable 100% proposed
Management Costs*	30% increase	80% increase	65% increase	35% increase	40% increase

*Includes only operations and maintenance budget necessary to fully implement the alternatives. Does not include budgets other than for the refuge staff. Does not include one time budget items for facility construction and so forth.

VI. ENVIRONMENTAL CONSEQUENCES

ENVIRONMENTAL CONSEQUENCES

The purpose of this section is to identify, describe, and compare the biological and socioeconomic impacts that would result from implementing each of the management alternatives. Each alternative contains many broad management directions detailing how the refuge would be managed under each given alternative.

To provide a basis for assessing the alternatives, descriptions of likely developments and events in the refuge were prepared for each alternative. These scenarios focus on prescribed burning on the refuge, oil and gas exploration and development, mining, and commercial timber harvest. None of the other permitted uses are expected to result in significant impacts. The scenarios for Alternative A depict only the current level of activity occurring on the refuge at the present time. In all of the scenarios it is assumed that reasonable management practices and the best available technology will be applied.

Comparison is fundamental to environmental assessment. Alternatives are evaluated by comparing potential impacts. Predicted impacts are calculated by comparing the "current situation" with situations projected to exist in the future. Because of the general nature of the assessment and the lack of numerical and statistical information regarding refuge resources, impacts are often expressed in relative terms. The meanings of these terms are as follows.

For fish and wildlife resources:

- Major impact - affecting a regional or local population of a species sufficiently to cause a decline in abundance or a change in distribution beyond which natural recruitment would not likely return that population to its former level within several generations.

- Moderate impact - affecting a portion of a regional or local population sufficiently to cause a change in abundance or distribution over more than one generation; unlikely to affect the integrity of the regional population as a whole.

- Minor impact - affecting a specific group of individuals of a population in a localized area for one generation or less; the integrity of the population is not likely to be affected.

- Negligible impact - the degree of anticipated biological impact is considered less than minor.

Note: Impacts associated with wildlife species on the refuge are often related primarily to habitat due to the lack of data related to wildlife populations on the refuge. See the discussion on lack of data in the Identification of Issues chapter (Chapter II).

Impacts are considered to be either short-term or long-term. Short-term impacts are generally considered to be impacts that remain less than five years (less than one year for impacts to fisheries and water quality); long-term impacts are considered to be impacts that remain more than five

years (more than one year for fisheries and water quality impacts). The use of mitigation measures to reduce or eliminate potential adverse impacts resulting from the implementation of the Yukon Flats Refuge CCP will be applied as standard practice whenever and wherever possible, relative to the goals and objectives of the plan being implemented.

It should be noted that neither the Service's selection of a preferred alternative, the scenarios developed for a given alternative, nor the adoption of a plan necessarily means that all of the specific developments and uses permitted in the plan would happen nor would all the impacts discussed necessarily occur. The impacts are based on the assumption that the activities described in the scenarios and other permitted activities are likely, at some time in the future, to occur on the refuge. Oil and gas leasing and associated development may be permitted only in intensive and moderate management categories as outlined in this document. Should it be determined at a future time that it is in the national interest to allow leasing on areas of the refuge in minimal management, the CCP will require revision. In the future, more detailed site-specific environmental assessments and environmental impact statements will assess proposed projects and proposed actions on the refuge.

ALTERNATIVE A (CURRENT SITUATION)

Alternative A depicts the current situation on the refuge. It focuses on maintaining the existing range and intensity of management actions and recreational and economic uses which now occur on the Yukon Flats Refuge. No wilderness has been designated on the refuge and none is proposed.

Scenarios

The scenarios developed for Alternative A generally depict the current level of activities on the refuge - prescribed burning, oil and gas exploration and development, mining, and commercial timber harvest. These scenarios are hypothetical depictions of what might occur in the future and are used only for purposes of analysis and comparison of impacts with the other alternatives presented in this document. Only limited expansion of activities is assumed under this alternative. Scenarios for the life of the plan are based on a projected 15 to 20 year plan life; long-term scenarios for wilderness analysis are 50 year projections.

Prescribed Burning. Several techniques for improvement of habitats exist, although prescribed burning is the only technique proposed by the refuge staff for use on the refuge. Prescribed burning is considered by the refuge staff to be the only viable technique available to restore and enhance wildlife habitats on a large scale on the refuge (wildfire - natural or man-caused - will have similar effects on wildlife habitats). Prescribed burning is the only technique which would be allowed under the minimal management category. No other terrestrial habitat manipulation techniques (mechanical or water level manipulation) are expected to be implemented on the refuge in the near future. Such techniques are impractical due to the lack of accessibility to most areas of the refuge, the significant logistical requirements necessary to implement these techniques, and the prohibitive costs. Under Alternative A, prescribed burning would be the only technique permitted as all refuge lands would be categorized as minimal management.

The refuge has prepared a prescribed burning plan which has been approved for implementation. Under the approved plan, prescribed burning will be accomplished through the use of an aerial ignition technique (because of remote setting and lack of road system). The use of natural fire barriers will control spread and direction of the burn. The primary purposes of the prescribed burning are to improve moose habitat (particularly along the western section of the refuge), to return a portion of the habitat to an earlier vegetational stage, and to reduce hazardous fuel loadings which may have resulted from past suppression of fires.

Four burn sites have been identified in the burn plan: T15N, R3W, Fairbanks Meridian (FM) (Beaver Quad); T16N, R6E, FM (Fort Yukon Quad); T15N, R3E, FM (Beaver Quad); and T14N, R2W, FM (Beaver Quad). Total acreage to be treated will range from 10,000 to 20,000 acres for each burn site. Sites are selected based on management objectives (improving moose habitat, increasing habitat diversity), history of successful suppression of fires on the site, and safety considerations (hazardous fuel reductions, fragmentation of continuous fuel bed). Sites are selected through consultation between the refuge and ADF&G.

Pre-burn surveys of plant and wildlife communities will be conducted for each prescribed burn. Post-burn vegetational surveys will be scheduled on intervals of one month, one year, and at five year intervals thereafter. Each individual prescribed burn plan will address treatment evaluation procedures and techniques in more detail. The initial prescribed burn was to have occurred in 1986 with additional burns scheduled on a biannual basis. However, the scheduled burn did not occur as weather conditions were never suitable for ignition. The prescribed burning program will be initiated during the summer of 1987 if the right conditions prevail. If post-burn surveys indicate that the prescribed burning program is successfully achieving the objectives of the program and additional burning sites can be identified, prescribed burning could continue on a biannual basis through the life of the plan, subject to the constraints identified for the currently proposed burns.

Although the current prescribed burning plan has identified only four sites for burning, the success of these burns in meeting the management objectives will influence the prescribed burning program on the refuge beyond these initial burns. If management objectives are being met and additional sites suitable for burning are identified on the refuge, burning projects could continue on a biannual basis beyond these initial burns, subject to the same constraints identified for the currently proposed burns.

Treatment constraints - If natural fire occurrences are severe before or during the proposed ignition time, the prescribed burn will not go into effect. Taking this into account, the prescribed burning will serve as a contingency in the event that natural ignitions do not occur to the extent desired to maintain habitat diversity.

Commercial Timber Harvest. In Alternative A all of the refuge lands would be designated as minimal management areas. No commercial timber operations are occurring on the refuge currently. For the purposes of analysis it is assumed that commercial timber operations would not occur on the refuge over the next 50 years.

Placer Mining. Mining activity presently occurring on the refuge is generally limited to that necessary for annual assessments as prescribed in the Mining Law of 1872. There are only four active mining claim case files on record with the BLM. All other case files involving mining claims on the

refuge have been closed (all claims have been voided). Since the annual assessment required by this law is only $100 per claim, very little activity actually occurs on the remaining claims (one trip to a claim during a season would cover the required assessment outlay). Such activity results in only negligible impacts. For the purposes of this scenario, it is assumed that mining activities on the refuge would not expand beyond the current level over the next 50 years.

Oil and Gas Exploration, Leasing, and Development. No oil and gas activities, including studies, exploration, or development (production), are currently occurring on refuge lands. However, in Alternative A, surface geologic studies, core sampling, seismic studies, and other geophysical studies would be permitted on a site-specific basis throughout the refuge. Specific seismic survey methods permitted would be determined by the refuge manager based on the specific needs of the study and the resources which may be impacted. Because of the expense involved in field work, seismic studies and core drilling would most likely occur on or near areas which would be available for oil and gas development. For the purposes of this scenario, it is assumed that oil and gas development will not occur on the refuge during the next 50 years. It is also assumed that some seismic studies and core drilling would occur even though no areas of the refuge would be open for leasing. The assumptions of this scenario are presented below.

Geologic Mapping

- One or two geologists would be involved.
- Field operations would be helicopter-supported.
- Field operations would take place during the summer.
- Rock specimens would be collected.
- Housing and logistics would be based in Fort Yukon.

Core Sampling

- Small helicopter-transported drilling rigs would be used to obtain core samples.
- Cores will be approximately 2 inches in diameter and a maximum of 250 feet deep.
- Drill cuttings would be returned to the bore hole.
- Core drilling would be completed within two years.
- Fifty people would be required to conduct the surveys and for logistical support.
- Housing and logistics would be based on private lands in the vicinity.
- Drilling fluids would be fresh water. Stipulations would be developed to ensure that the use and disposal of water would not degrade refuge resources.
- Field operations would be conducted between January and March when disturbance of surface vegetation and wildlife would be minimized.

Seismic Studies

- 24 seismic lines (20 foot right-of-way, 15 to 20 miles each) would be completed.
- All proposed shot lines would be reviewed and approved by the refuge manager prior to field operations.
- Field operations would be conducted between January and March when disturbance of surface vegetation and wildlife would be minimized.

- Seismic surveys would be conducted over no more than three years using a 20-member crew, 3 helicopters, and 10 snow machines or low pressure vehicles.
- State-of-the-art seismic survey techniques would be used.
- Seismograph units would be transported by helicopter.
- Geophones and cable would be moved along seismic traces by snow machine, low pressure vehicle, or on foot.
- The necessary energy source would be small dynamite charges placed on boards. No shot holes would be bored.
- Seismic lines would not be clearcut.

Biological Effects of Alternative A (Life of the Plan - 15 Years)

Vegetation. The changes in vegetation occurring in Alternative A would be caused primarily by successional changes resulting from wildfire and by flooding. Prescribed burning would be allowed throughout the refuge under this alternative. The refuge has an approved prescribed burning plan (see Prescribed Burning scenario) which identifies four areas to be burnt. Burns will be undertaken biannually with a total of 10,000 to 20,000 acres burned at each site. Some crushing of vegetation would occur along seismic lines, although these impacts would be limited with state-of-the-art techniques being used and activities confined to the winter. Overall, only negligible impacts would occur locally, the result of seismic activities and other oil and gas exploration activities which may be allowed throughout the refuge. Both fires and floods are common in the Yukon Flats. Bureau of Land Management fire history records indicate that approximately 1,200,000 acres burned on the Yukon Flats in about 20 years.

Setting plant succession back benefits moose and other species which utilize the lusher herbaceous and young shrubby growth abundant in recently disturbed areas. Under natural conditions climax forest does not last long in interior Alaska. There are no records of spruce older than 300 years in the interior (Foote 1983). Black spruce succeeds black spruce and white spruce follows white spruce when burned. However, intermediate successional stages vary according to time and intensity of burn and site factors (Foote 1983). Successional stages are also affected by the discontinuous permafrost which underlies the Yukon Flats. Although it is difficult to predict how vegetation will change on the Yukon Flats Refuge, this alternative would generally reflect natural conditions.

Wildlife. Wildlife populations and habitats would change over time from current levels and conditions. Most changes would result from natural fluctuations and increasing use resulting from growing human population in Yukon Flats communities and in the State of Alaska as a whole. This gradual evolution of the existing situation would continue until the plan is updated in 10 to 15 years or until some unforeseen development occurs causing the plan to be revised earlier. With plan revision, management direction may change significantly.

Wildfire and flooding are the primary causes of set back in plant succession on the refuge under current management, although prescribed burning would be allowed throughout the refuge (four sites of 10,000 to 20,000 acres each are proposed for burning). Some species would benefit from the set back in successional stages and release of nutrients resulting from prescribed

burning, wildfire, or flooding, while other species would be adversely effected. Waterfowl would be affected differently depending on the location of prescribed burns and wildfires. In areas where lakes and ponds are low in nutrients, burning could result in the release of nutrients as ash is leached by surface runoff and as groundwater flow increases with retreat of permafrost in burned areas. As nutrient content increases in these lakes and ponds, they improve as waterfowl habitat. Burning could, in turn, have minimal adverse affects on waterfowl production through the loss of nesting habitat and increased siltation in areas where production is currently high. Flooding would also have both adverse and beneficial effects on waterfowl, causing loss of habitat in some areas and creating new habitat in other areas. Overall, impacts on waterfowl from wildfire and flooding would be negligible.

Species, such as moose, which rely on early successional vegetation (e.g., willows and other browse species), benefit from the continuous regeneration of browse along streams and rivers in the refuge resulting from flooding and natural bank cutting activities as well as from the regeneration of browse in prescribed burn sites and wildfire burn areas. Some furbearer species, marten in particular, also receive negligible benefits from prescribed burning and wildfire as the edges between the habitats which support high densities of prey species would increase (Koehler and Hornocker 1977, Buskirk 1983).

Oil and gas exploration, including seismic activities, would also be allowed on the refuge under Alternative A, where compatible with refuge purposes. Activities such as geologic mapping, sampling of surface rock, and shallow core drilling would be expected to have impacts for only the short duration during which the activities are occurring, negligible overall impacts on wildlife. Seismic activities, if carried out utilizing air-transported seismographic equipment, would also have minimal impacts on wildlife. These techniques limit the amount of overland travel between sites and do not require clearing of shot lines. Localized crushing of vegetation would occur along shot lines. Shrubs, such as willows, are damaged by crushing at any time of the year and require several years to recover (USDI-FWS 1982), resulting in negligible loss of habitat for species such as moose. Gouging of soils or damaging of stabilizing vegetation on river banks can result from vehicle travel, leading to localized alteration of river channels and siltation of rivers with subsequent impacts on aquatic species and waterfowl. Overall effects would be negligible with stipulations, such as restricting activities to winter with adequate snow cover and using snowmobiles or vehicles with low-pressure tires (such as Rolligons), minimizing impacts.

Camps and equipment staging areas could also have some slight adverse impacts on wildlife, being sources of occasional accidental spills of fuel oil, dumping of garbage, and deliberate food handouts. Oil reduces plant growth, productivity of aquatic invertebrates, and survival of fish and waterfowl (USDI-FWS 1982). Providing artificial food sources for scavenging predators such as foxes, wolves, and bears (in summer) can cause eventual conflicts with humans as the animals loose their fear (Milke 1977). Since behavioral changes and concentration of populations take several seasons to occur, the presence of seismic crews would be expected to have only a localized negligible short-term impact on these species.

Disturbance of wildlife can occur during seismic activities due to motorized equipment, aircraft use, human activity, and explosions. Sensitive species include swans, bald eagles, peregrine falcon, ospreys, grizzly bears, wolves, and wolverines. Restricting activities to winter would avoid impacts on birds and bears. Wolves and wolverines may avoid areas of activity, but

only negligible impacts would result due to the short-term and localized nature of the activity. Moose are not disturbed significantly by winter seismic activities if accustomed to some human activity (Bangs and Bailey 1982).

Fishery Resources. Fish populations and habitats would change over time from current levels and conditions. Most changes would result from natural fluctuations and the increase of use resulting from a rise in human populations in the Yukon Flats communities and in the State of Alaska as a whole. Commercial, subsistence, and sport fish harvest levels would remain relatively constant at current levels, fluctuating occurring primarily because of a given year's salmon run. It is possible that unforeseen events may affect fisheries, but these occurrences are, by definition, unknown. This gradual evolution of the existing situation would continue until the plan is updated in 10 to 15 years, at which time management directions may change.

Some impacts to the refuge fishery may occur due to the personnel employed in oil and gas studies (may be allowed throughout the refuge). Use of easily accessible fishing areas could cause moderate impacts to population levels, although most activities would be undertaken during the winter. Use of surface equipment in seismic exploration activities could result in negligible to minor impacts to fisheries resources through increased siltation resulting from overland travel and damage to streambanks and streambeds from seismic crews crossing streams. Seismic explosions can severely disturb fish if close to critical habitat such as overwintering pools (USDI-FWS 1982a). Camps and equipment staging areas are sources of pollution such as domestic sewage, which reduces oxygen in natural waters and can have a major impact on overwintering pools (USDI-FWS 1982a). The addition of organics, such as domestic sewage, must be carefully studied because of the low winter oxygen content of some Alaskan streams (Schallock 1974). Accidental spills of fuel oils may also occur potentially reducing aquatic productivity and fish survival (US Corps of Engineers 1980). Oil has a toxic effect on biota and interferes with aeration and photosynthesis, causing oxygen depletions and fish kills. These impacts can be reduced by applying site-specific stipulations and mitigation.

No biological effects are expected from the limited amount of mining activity occurring on mining claims on the refuge (primarily associated with annual assessment work required by the Mining Law of 1872). Mining on claims located outside refuge boundaries could potentially have a major adverse impact on refuge fisheries. Turbidity, silt, and trace amounts of heavy metals from some mining operations can reduce fish reproduction and survival (Weber and Post 1985, Alaska, University of, 1986). However, only minor impacts are expected because of water quality monitoring, strict enforcement of State Water Quality Standards, and studies to monitor baseline fish populations and to locate spawning and rearing areas of some salmon. Mitigation could be proposed which would limit the extent of impacts.

Four prescribed burning projects have been identified in the scenario, each of which would cover 10,000 to 20,000 acres of refuge land. Prescribed burning would be monitored and the impacts, if any, should be minor if burns occur as described in the scenario. Increased siltation and water temperatures are the major effects of fire on fish and other aquatic organisms. Very little surface erosion occurs on burned sites in interior Alaska except where heavy equipment is used for suppression (AIFMC 1982). Wildfires (or prescribed fires which have become wildfires) which remove stabilizing vegetation from stream banks or steep watersheds could cause accelerated erosion, leading to increased turbidity and stream sedimentation, severe braiding, and increased

water velocity. This may prevent fish from spawning and feeding in such areas. Water quality and fish habitats will be monitored after burning, so impacts can be determined and findings utilized if other habitat improvement projects are undertaken in the future.

Water Quality and Quantity. Water quality and quantity would not change significantly over the long-term under Alternative A, the current situation. Negligible short-term impacts, such as slight increases in run-off, soil erosion, and siltation, may occur in localized areas of the refuge as a result of prescribed burning, wildfire, and fire management practices, seismic activities and other oil and gas studies, or other activities permitted under this management alternative. Some localized minor impacts to water quality could result from accidental fuel oil spills and from introduction of organics into the refuge waters during oil and gas exploration or other activities on the refuge. Public use would remain near current levels (recreational use would increase no more than 25 percent to a total of 1, 250 visitor use days annually), with no appreciable effect on refuge water quality and quantity.

Visual and Air Quality. Few activities are permitted on the refuge under current management that result in impacts to visual and air quality. Seismic activities have occurred (prior to refuge designation) and may be allowed (if determined to be compatibility) to continue throughout the refuge. Visual impacts, resulting from past seismic work, remain evident today and new seismic work could result in additional visual impacts on the refuge although air-transported seismic equipment and not clearcutting shot lines would significantly reduce the extent and duration of such impacts. Prescribed burning projects would be designed to simulate wildfires, thus limiting the visual impacts of such burns. Short-term impacts to air quality would result from prescribed burning, but wind conditions should be such that smoke will not be directed at nearby villages or other areas of development. Overall, only negligible impacts to visual and air quality on the refuge have occurred in the past. Continuing present management would not result in any significant change in impacts to visual and air quality.

Socioeconomic Effects of Alternative A (Life of the Plan - 15 Years)

Human Population. Of all the alternatives considered, Alternative A would have the least impact on the population of local communities. With all the refuge in minimal management, maintenance of the pristine conditions and fish and wildlife populations and habitats on the refuge would be the primary management objective on the refuge. Subsistence and recreational use would not change significantly over the next 15 years. Recreational use would increase by no more than 25 percent (to a total of 1,250 visitor use days annually). Development activities would, in general, not be allowed on the refuge. Oil and gas exploration, including seismic activities, would be allowed. Seismic surveying and core drilling would utilize a primarily transient work force on a seasonal basis (50 or less people, mainly during winter). The permanent population of communities on or near the refuge would not change significantly as a result of implementing Alternative A.

Social Conditions. Negligible change in social conditions on the refuge would occur if present management directions are continued, as prescribed in this alternative. The traditional lifestyle of local residents would not be

altered. With little improvement in access, the interaction between local communities would not change significantly. Recreational use of the refuge would not increase substantially (no more than 25 percent) over the next 15 years. Only a small transient work force would be involved in seasonal activities, such as seismic and other geologic exploration, on the refuge. Interaction between local residents and non-local users would not change significantly.

Economy. Alternative A would not affect the economies of local communities significantly. Oil and gas studies, including seismic activities, would be the only economic activities permitted on the refuge which would result in any significant influx of non-locals. This would be only a small, primarily transient work force which would have limited impact on the local economy. Recreational use would not change significantly from current levels (an increase of no more than 25 percent would be expected). Therefore, Alternative A would have only negligible effects on the number of jobs available and on local business revenues.

Recreation. Management of the refuge under Alternative A would continue as it is currently. Use patterns on the refuge would remain basically unchanged. Recreational use would remain at or near current levels (no more than a 25 percent increase in recreational use is projected), with subsistence use by local residents the major element of public use. Oil and gas studies, which may occur, would result in a seasonal work force on the refuge. This transient work force is generally employed during the winter when recreational use would be low. A limited number of recreational users participate in activities on the refuge. Any increase in recreational use would be slow, occurring primarily as a result of regional population growth.

Cultural Resources. Current use patterns on the refuge would continue under this alternative. Most use on the refuge would continue to be subsistence-related. Recreational use would remain low and would, in general, have only negligible impacts on the cultural resources of the refuge. Geologic and geophysical studies (including seismic exploration), fire management, and a limited number of other activities could occur in this alternative. These activities could result in incidental damage, generally negligible in nature, to cultural resource sites. Potential damage to cultural resource sites would be avoided whenever and wherever possible by completing cultural resource inventories and evaluations and through the use of mitigation or preservation measures.

Subsistence/Section 810(a) Evaluation and Finding. The following section examines the impacts on subsistence that would result from implementation of Alternative A (the current situation). It conforms to guidelines recommended by the Alaska Land Use Council for complying with Section 810 of ANILCA.

The current level of opportunities to participate in the subsistence lifestyle would be maintained under Alternative A. All refuge lands would be in the minimal management category. Economic uses of the refuge, including oil and gas leasing, would not be permitted. Exploration activities, including seismic and core drilling, may be allowed throughout the refuge. Four prescribed burns (each cover 10,000 to 20,000 acres) are identified in the scenario for this alternative. Prescribed burning would result in short-term impacts to certain subsistence species, but in the long term such

activities would improve habitat conditions and be beneficial to many fish and wildlife species. Recreational use of the refuge would not be encouraged and only limited growth would be expected. Use of the refuge and its resources would remain at or near current levels.

Adoption of Alternative A would not result in any significant direct impacts on subsistence resources, adverse impacts to habitat, or increased competition for the resource. The distribution, migration, or location of resources harvested by subsistence users would not be altered appreciably. Minor short-term impacts resulting from seismic surveying could result in the displacement of wildlife and possible disruption of trapping activities for short periods of time in localized areas of the refuge. Overall, impacts to subsistence resources would be negligible.

Availability of Other Lands - Section 810(a) of ANILCA requires that the availability of other lands be considered in evaluating the effect of refuge management alternatives on subsistence uses. This plan is a refuge plan by definition and addresses the general suitability of a broad range of activities for refuge lands. Thus, although other lands may be available for the uses considered, lands outside of the refuge are not considered because they are beyond the scope of this plan.

Other Alternatives - Consideration of other alternatives is also required by Section 810(a). Five management alternatives have been analyzed for the Yukon Flats Refuge. Alternative A, the Current Situation, has few impacts on the subsistence way of life. All refuge lands would be classified as minimal management. Alternative D, the Service's preferred alternative, and Alternative E are similar to Alternative A in that all refuge lands would be classified as minimal management. They differ from Alternative A in that lands would be proposed for designation as wilderness (eight percent in Alternative D; all refuge lands in Alternative E). Under these alternatives, opportunities to participate in subsistence activities would be maintained and implementation would have negligible effects on the subsistence way of life, although the presence of seismic and core drilling crews on the refuge may intensify the concerns of local residents about overuse of the resources and interference with their subsistence lifestyle.

Alternative C may open about one fourth of the refuge to oil and gas development and associated activities, resulting in localized, long-term impacts to resources taken by subsistence users. Although opportunities to participate in subsistence activities would not be affected, the presence of oil and gas workers on the refuge would intensify the concerns of local residents about overuse of resources and interference with their subsistence lifestyle. Alternative B would allow oil and gas development and associated activities and commercial timber harvest on 68 percent of the refuge. Other economic uses and a number of public facilities would be allowed on 22 percent of the refuge. Although opportunities to participate in the subsistence lifestyle would not be significantly altered, improved access, increased recreational use, and more economic development would result in long-term impacts to subsistence resources and activities and increased concern by local residents that their subsistence lifestyle would be threatened.

Other alternatives were considered during early stages in the planning process. Many of these alternatives fell within the range of alternatives which are evaluated in this document and would result in variations of the impacts discussed in this document. Other alternatives opened more of the

refuge to development of public facilities and economic uses. These alternatives were determined not to meet refuge purposes as outlined in ANILCA and were, therefore, not evaluated further in this document.

Finding - Based on the above evaluation, Alternative A would have only negligible localized impacts on the harvest of resources on the Yukon Flats Refuge by local residents. No oil and gas leasing and development is considered in this alternative. No mining activity, other than that necessary for proof of validity, is considered. Recreational use of the refuge by non-locals is not projected to increase significantly. No commercial timber harvest would occur. Impacts to the biological resources harvested by local residents are negligible. Thus the subsistence way of life in the communities on the refuge should not be significantly effected.

Wilderness Designation Effects of Alternative A (50 Years)

In Alternative A, no lands on the Yukon Flats Refuge would be proposed for wilderness designation. All of the refuge would be managed under the minimal management category during the life of the plan. Under this alternative the Service would retain maximum management flexibility for the the refuge in the future. With revision of the plan, areas of the refuge could be developed for increased public use or economic uses that might not protect wilderness values, but would be compatible with refuge purposes.

Impacts on Area not Proposed for Wilderness

Effects on Wilderness Values. Solitude and naturalness are two of the key qualities provided in a wilderness. To assess impacts to wilderness values two criteria that can be used are whether the "works of man" remain substantially unnoticeable and whether the condition of the area remains basically unchanged - "natural" - prior to designation as wilderness.

What constitutes a wilderness experience, and what activities would adversely affect this experience, is largely dependent on an individual's expectations, perceptions, and beliefs. This difference in perceptions and viewpoints makes it extremely difficult to assess how an alternative would affect the wilderness values of the Yukon Flats Refuge. Almost any amount of use in an existing wilderness area will have some impact on the solitude and naturalness of the area.

Naturalness - Activities which would be allowed on the refuge and which could affect naturalness in the short and long term include prescribed burning, core drilling, and seismic exploration. Core drilling and seismic exploration, although allowed throughout the refuge, would most likely occur in the area of the refuge identified as having moderate potential for oil and gas discovery (68 percent of the refuge, see Figure 7). These activities would occur during the winter. Crushing of vegetation would occur along the 360 to 480 miles of seismic lines (within a 20 foot right-of-way, less than 1,000 acres) and in a small area at each core drilling site (less than one acre per site). Sensitive wildlife, primarily wolves and wolverines, would be displaced from the area of seismic activities and core drilling while these activities are occurring. Most other species sensitive to disturbance (e.g., swans, bald eagles, peregrine falcon, ospreys, and grizzly bears) would not be present during the winter months. Visual impacts would also be evident as

people (50 or less) and equipment would be present in the project areas and crushing of vegetation would occur. Because of the short duration during the winter when these activities would occur and the small area involved, any impacts to the naturalness of the refuge would be short-term and negligible. In the future, oil and gas leasing could also occur on the refuge if such leasing is determined to be in the national interest and if leasing is determined to be compatible with the refuge purposes, although a revision of the plan would be necessary before leasing could occur. This situation is not projected for this alternative, however.

Mining activities on the refuge are, and would continue to be, generally limited to annual visits to the claims with little or no actual mining activity occurring (to meet the 100 dollar per claim assessment requirements of the Mining Law of 1872). Impacts of mining on naturalness associated with this level of activity would be confined to impacts associated with travel to and from the claims, the presence of people on claims for a short period (probably no more than two weeks) each summer, limited site clearing, and possibly some installation of machinery or structures. Disturbance of surface vegetation would be very localized, with a maximum of 10 acres being affected in the refuge. Commercial timber harvest is not currently occurring on the refuge and would not be allowed under this alternative. Recreational use, although expected to increase by up to 25 percent (to a total of 1,250 visitor use days annually), would not affect the naturalness of the refuge because of the limited number of visitors in comparison to the large size of the refuge.

Prescribed burning projects (four burns of 10,000 to 20,000 acres each, to be burnt on a biannual basis) would have little effect on the naturalness of the refuge. Burn sites would appear generally the same as if a wildfire had burnt the site. Wildfire is considered a natural part of refuge ecosystems.

Outstanding opportunities for solitude - Mining activities on the refuge are currently very limited (see discussion above) and are projected to remain so over the long term under this alternative. However, a small degree of disruption to solitude would occur from noise generated through travel to and from the claims and from the operation of machinery at the claims. Solitude is expected to be affected on less than 100 acres for no more than 30 days each year.

A small number of people (50 for core drilling, less for seismic activities and mapping) would be involved in oil and gas exploration activities on the refuge. With activities occurring primarily during the winter, opportunities for solitude for the wilderness user on the refuge would not be affected as a result of oil and gas exploration activities.

Recreational use would increase by up to 25 percent and subsistence use would change only as the regional population grows. Such changes would not be enough to effect opportunities for solitude on the refuge. Users during hunting season may occasionally encounter other parties. However, except for limited contact along major river systems, outstanding opportunities for solitude would still exist.

Outstanding opportunities for primitive recreation - Recreational use would increase by up to 25 percent (to a total of 1,250 visitor use days annually) under this alternative. This change would not significantly affect opportunities for primitive recreation on the refuge because this increase in use, although potentially concentrated along major waterways on the refuge, would be dispersed over a period of four to five months each year. Core drilling and seismic activities would occur primarily during the winter with

only a small number of people involved (50 or fewer). Mining activities, because of the limited number of active claims and the lack of active mining, would result in only negligible impacts (less than 10 acres would be affected, primarily in areas not used by most recreational users).

Special features - The Yukon Flats Refuge contains several special features, including the Yukon River and its tributaries; the Yukon Flats (one of the most productive waterfowl breeding and production areas in North America); the White Mountains; one of the most productive lynx habitats in Alaska (the Black River area); and 15 national resource species (wildlife and fish - identified in the Existing Environment Chapter). Prescribed burning (four burns of 10,000 to 20,000 acres each to be burnt on a biannual basis) would result in temporary loss of vegetation from the burn area (regeneration would be evident within 30 days of the burn) and temporary displacement of wildlife species found on the burn sites, but in the long term burns would improve habitats for many species (such as waterfowl, moose, and various furbearer species). Recreational use would increase by up to 25 percent (to a total of 1,250 visitor use days annually). This increase would not effect the special values of the refuge.

The limited scope and/or short-term nature of oil and gas exploration activities and mining under this alternative would not result in any adverse impacts to the special features of the refuge.

Conclusion: Effects on wilderness values. The management actions proposed in this alternative, both for the life of the plan and over the long term, would not have any significant effects on the wilderness values of the refuge as pointed out in the preceding analysis. As discussed above, oil and gas exploration activities could result in some temporary impacts to vegetation (e.g., crushing along 360 to 480 miles of seismic lines - no more than 1,000 acres - and around core drilling sites - less than one acre per site), temporary displacement of sensitive wildlife during the period of activity, and visual impacts resulting from the presence of work crews of 50 or fewer people and from the vegetation impacts, thus affecting the naturalness of areas immediately adjacent to seismic lines and core drilling sites which could be located throughout the refuge. Opportunities for solitude would be affected by noise and visual impacts from mining activities (on less than 100 acres), increasing recreational use (25 percent above current levels dispersed over a large area of the refuge), and from oil and gas exploration activities (on some 1,000 acres with 50 or fewer people involved), although impacts would be negligible in extent. Prescribed burning would have negligible affects on wilderness values. There would be no significant impacts to opportunities for primitive recreation and special features of the refuge under this alternative.

Effects on Prescribed Burning. Under the prescribed burning scenario for this alternative, four sites have been proposed for burning (additional burn sites could be proposed in the future). All the proposed sites are in the Flats Wilderness Review Unit. Each burn would cover 10,000 to 20,000 acres. No other habitat improvement techniques would be used on the refuge. The lack of a wilderness proposal under this alternative would not effect prescribed burning on the refuge nor would any other management actions which are projected to occur.

Effects on Commercial Timber Harvest. No commercial timber harvest is presently occurring on the refuge. Commercial timber harvest would not be

allowed on the refuge under Alternative A. The lack of a wilderness proposal under this alternative would not effect commercial timber harvest on the refuge.

Effects on Mining Activities. Mining activity presently occurring on the refuge is generally limited to that necessary for annual assessments as prescribed in the Mining Law of 1872 (100 dollars of expenditures per claim). There are only four active mining claim case files on record with BLM and no patented claims occur on the refuge. Under Section 304(c) of ANILCA all public lands ". . . in each National Wildlife Refuge . . . are hereby withdrawn, subject to valid existing rights, . . . from all forms of appropriation or disposal under the public land laws, including location, entry and patent under the mining laws . . ." The lack of a wilderness proposal under this alternative would not effect mining activities on the refuge.

Effects on Oil and Gas Activities. No oil and gas studies, exploration, or leasing and development activities are occurring on the refuge at the present time. Under the current Service oil and gas policy for Alaska refuges (and the oil and gas scenario for this alternative), oil and gas exploration activities (including seismic) could occur on refuge lands under all management categories. However, seismic exploration, core drilling, and other oil and gas studies involving the use of motorized equipment would not be permitted in designated wilderness unless conducted by (or for) an agency of the Department of the Interior pursuant to Section 1010 of ANILCA. Oil and gas leasing is not permitted in designated wilderness. With no proposed wilderness areas in this alternative, oil and gas exploration activities would not be affected. Oil and gas leasing would not be permitted at this time as all refuge lands would be placed in the minimal management category. However, the refuge could be opened to leasing in the future (by revising of the plan) if leasing is in the national interest and is determined to be compatible with refuge purposes.

ALTERNATIVE B

Alternative B, as described in the Management Alternatives chapter, would permit the highest level of economic development and habitat manipulation of the five alternatives. No wilderness is proposed.

Scenarios

The scenarios developed for Alternative B depict projected future levels of prescribed burning on the refuge and levels of oil and gas exploration and development, mining, and commercial timber harvest on the refuge. These scenarios are hypothetical depictions of what might occur in the future and are used only for purposes of analysis and comparison of impacts with the other alternatives.

Prescribed Burning. A number of techniques are available for terrestrial habitat improvement and could potentially occur on the Yukon Flats Refuge under the various management categories. Under Alternative B, habitat improvement techniques, such as mechanical manipulation and water impoundments and diversions, could be used in areas of the refuge under intensive and

moderate management. However, prescribed burning is considered by the refuge to be the only viable technique available to restore and enhance wildlife habitats on the refuge (wildfire - natural or man-caused - will have similar effects on wildlife habitats). Prescribed burning is the only habitat improvement technique proposed by the refuge staff for use on the refuge. No other terrestrial habitat improvement techniques are expected to be implemented on the refuge in the near future. Such techniques are impractical due to the lack of accessibility to most areas of the refuge, the significant logistical requirements necessary to implement these techniques, and the prohibitive costs.

The prescribed burning scenario for Alternative B assumes that the same projects will be undertaken as are identified in the Alternative A scenario with the same assumptions and constraints being applied. Four burn sites have been identified and, depending on the success of these burns in meeting their intended objectives, additional sites may be identified for future burning. See the prescribed burning scenario under Alternative A.

Commercial Timber Harvest. In Alternative B, 68 percent of the refuge would be in intensive and moderate management, management categories which permit commercial timber harvest. Local interest has been expressed in such timber harvest. This interest is primarily in the harvest of timber for local use (firewood, house logs, and lumber for local construction needs). For purposes of this scenario, it is assumed that Fort Yukon would be the only community that would support a commercial operation in the foreseeable future. The other villages use wood primarily for subsistence purposes (i.e., firewood, house logs), have alternative sources of timber on non-refuge lands (e.g., Native lands), and are not willing (or able) to pay for the type of timber available from refuge lands. For Fort Yukon it is assumed that all of the firewood needs would be met from non-refuge lands. Most of the demand for house logs and lumber also would be satisfied from nearby Native lands. The scenario also assumes:

- A special use permit would be required before commercial timber operations would be allowed on refuge lands. The permit would include a set of special conditions to ensure that resources in the area are not abused. The stipulations would address site preparation, restoration, and reseeding of the site, areas of soil disturbance, etc.
- Lumber from the refuge would be used as construction materials to replace or build new log houses, frame houses, and public facilities. A 30 by 30 foot log cabin would use approximately 6,500 board feet of timber. Assuming Fort Yukon residents are willing to pay for timber from the refuge for the construction of five log cabins, about 32,500 board feet would be required as house logs. An additional 50,000 board feet would be needed to meet lumber needs. Thus, the commercial timber operation would cut 82,500 board feet of green timber from the refuge in the year 2000. Demand for refuge timber is not expect to grow beyond this level over the next 50 years.
- All of the timber would be cut along the Yukon River upstream of Fort Yukon--within one mile of the river--between October and May. The commercial operation would use a group selection silvicultural system, with small (not to exceed one acre) clearcut areas being created. Harvest would consist primarily of old growth white spruce.

- Along this segment of the Yukon River an average yield of 5,000 to 7,000 board feet per acre would be anticipated. It is assumed that a total of not more than 20 acres along the Yukon River, using the group selection silvicultural system, would supply sufficient timber to meet the annual demand from Fort Yukon residents.
- The timber cut along the river would be floated down the Yukon River to Fort Yukon or adjacent Native lands where a portable saw mill would cut the green timber into dimension lumber or the logs would be prepared for construction.
- Four people would be needed to cut and haul the logs and operate the saw mill. Access to the logging sites would be by motorboat during the summer or overland during the winter.

Placer Mining. Only a limited number of mining claims remain on the Yukon Flats Refuge. Of 332 mining claim case files held by the Bureau of Land Management, only four files remain active. All other case files are closed with all claims voided. No claims have been patented on the refuge. Sites of the four active cases are all located in the northeastern area of the refuge in the vicinity of Chandalar Creek. This scenario assumes that a placer mining operation for gold recovery will be developed on one of the claims. Other assumptions include:

- A plan of mining operations and a special use permit would be requested (although not required) before mining activities would be allowed. These should lay out the types of facilities needed, the expected level of activity, the methods of mining to be used, the quantity of water needed, and the methods of mitigation and restoration which would be employed. In addition the the plan of mining operations and special use permit, all other applicable federal, state, and local permits would be required.
- The Service would monitor mining operations to ensure that all applicable laws, regulations, and permit stipulations are followed.
- Equipment would be moved overland to the site during the winter.
- Access to the site would be through the use of an airstrip built adjacent to the mining site. Unimproved roads, totaling less than 5 miles, would be built from the strip to the mining area.
- Support facilities would include a bunkhouse/cookhouse, workshop, and storage facility for equipment.
- Mining operations would be expected to last no more than 10 to 15 years.
- Mining would occur from June through September each year. Additional time may be needed to clear overburden, maintain equipment, or construct buildings.
- The placer operation would involve two to three people and three to five acres of ground per season.
- The operation would be conducted with two caterpillar tractors (cats), a sluice, and a backhoe or front-end loader.
- The vegetation and overburden would be cleared with the cats and the mineral bearing gravels would be pushed into the sluice box for processing.
- Gravels would be commonly cut from a face nearby, but may be excavated from the channel itself. Gravels would be placed in the sluice and washed down with water diverted from the stream. During sluicing operations, sands and silts would be deposited in settling ponds as required by law. These settling ponds would be constructed to remove solids from the water before returning it to the active stream channel.

- Material that has been run through the sluice would be used to level already mined areas.
- An average of approximately 500 cubic yards of material would be moved each day.
- An average of approximately 1.1 cubic feet per second of water would be used per day, although this could vary depending on the mining methods used. Water would be taken from streams adjacent to the mining site. Whenever possible, water would be recycled. All clear water not needed in the operation would be diverted around the active mining area.
- When the mining operation permanently closed down, all tailings would be recontoured. Contouring would approximate the natural contours of the area. The settling ponds would be allowed to dry and then be reclaimed. The area would be left to revegetate naturally.

Oil and Gas Exploration, Leasing, and Development. In Alternative B, geologic exploration, including surface rock collecting, gravimetric surveying, and geological mapping activities would be permitted on a site-specific basis throughout the refuge. These activities require essentially no surface disturbance. In addition, seismic surveying and subsurface core drilling could be permitted throughout the refuge, with restrictions placed on activities in designated wilderness. Specific seismic survey methods permitted would be determined by the refuge manager based on the specific needs of the study and the resources which may be impacted. Because of the expense involved in field work, seismic studies and core drilling are likely to occur only on lands which would be available for oil and gas development. Leasing and development activities would be permitted on refuge lands under the intensive and moderate management categories in Alternative B. The assumptions of this scenario are presented below.

Geologic Mapping, Core Sampling, Seismic Studies

See the assumptions in the scenario for Alternative A.

Exploratory Drilling

The exploration phase of oil and gas development would begin if favorable conditions are encountered during the initial studies. Assumptions for exploratory drilling include:

- Drilling activities on the refuge (in the Black River area and Birch Creek - Beaver Creek area) would occur over a four year period.
- Two winter seasons of four to five months would be required to drill three wells in each of the areas.
- During the first winter, site preparation and partial rig-up would be accomplished. Camp would be closed in April.
- Camp would be reopened the following November and ice airstrips and ice roads would be rebuilt. Drilling would occur from December through April.
- A crew of 60 people, including rig crew and support personnel, would be required to complete each well. The camp would support three crews, a total of 180 people.
- The crew would be housed on-site, and staging areas would be located off refuge lands.
- Rig components would be moved by low ground pressure vehicles (Rolligon) with a maximum of four pounds/square inch surface pressure. This would help minimize disturbance to surface vegetation.

- Gravel required for each drill pad (35,000 to 50,000 cubic yards) would be mined from less sensitive areas of nearby floodplains.
- Environmental guidelines and additional restrictions imposed by the refuge manager in the special use permits and approved plan or operation would apply to all operations. Drilling would be restricted to times when disturbances to fish and wildlife could be minimized.
- Logistical support and worker housing would be based in Fort Yukon. An airstrip located in close proximity to the three pads would be used as an on-site staging area. Helicopters would provide primary logistical support to each rig site.

Production

The following production scenario was developed by the BLM (Banet 1987) and has been modified for use in this document. This document is available for public review at the Yukon Flats National Wildlife Refuge headquarters in Fairbanks, Alaska, and at the USFWS Regional Office in Anchorage. A limited number of copies are also available on request at the Regional Office.

In the event of an economic oil or gas discovery, development and production activities would begin on a year-round basis. Proposed plans for production and transportation facilities would be developed and, once approved, construction of permanent drilling/production pads, air support facilities, roads, and pipelines could begin. Depending on field size and the reservoir characteristics, these fields are expected to produce for 15 to 30 years. For purposes of analysis it is assumed that two production sites would be developed, one site in the Black River country east of Tiinkduhl Lake and one site in the Birch Creek-Beaver Creek area of the refuge. The specific location of production facilities would depend on the actual location of the field. Potential staging areas would be Fairbanks, Fort Yukon, Circle, or the Trans-Alaska Pipeline System (TAPS) haul road (Dalton Highway).

The main production pipeline leaving both fields would be an 8 to 16 inch diameter elevated pipeline. Several potential routes for these pipelines could be used, depending on the circumstances at the time production begins. For analysis purposes, it will be assumed that the pipeline from the eastern field would connect with the second field and that the production pipeline would continue westward across the refuge to the TAPS facilities at the Yukon River crossing. These fields would be developed without any road connection to the Dalton (haul road) or Steese highways.

The production scenario also assumes the following:

Central Production Facility

- A central production facility (headquarters and primary operations center) occupying 90 acres would be constructed at each field (approximately 725,000 cubic yards of gravel would be required to construct this pad).
- Permanent (life of the project) housing modules, designed to accommodate 150 to 300 workers, would include sleeping and eating quarters, food storage area, and recreational and sanitation facilities. Adjoining offices would house administrative, engineering, communications, and other support services.
- Production facilities would separate the production fluids into oil, gas, and water. Oil would be dehydrated and piped to market. Produced gas would probably be dehydrated and compressed for facility use or reinjected into the subsurface structure. Produced water would be pumped to injection wells for disposal.

- Water for domestic use would be obtained from nearby water sources. Insulated tanks would store sufficient water for human consumption. Sewage treatment facilities and an incinerator would eliminate most human waste and trash. Items which could not be burned would be transported to an approved disposal site.
- Fuel storage tanks would hold diesel and other refined petroleum products for operating equipment throughout the field. The area would be diked for potential spill containment. Electricity would be provided by a diesel powered generation plant.

Drilling/Production Pad

- A minimum of five well pads would be drilled in each production field. Drilling rigs and support modules would be the initial equipment on the pads with wellheads, pipelines, and the gathering facility put in place as wells are completed. The size of these pads (20 to 30 acres) is dependent on the number of wells drilled and the distance between wellheads. All pads would be five feet thick and would require an average of 200,000 cubic yards of gravel per pad. Each well pad would be designed to produce approximately 5,000 acres.
- Depending on the proposed depth and subsurface conditions, production wells will take 10 to 60 days to drill and complete. Most production wells will be directionally drilled from the pad, allowing for maximum depletion of the reservoir and minimizing the surface acreage disturbed. Production from each well will be piped to the gathering facility where it will be metered and piped to the central production facility. Drilling will continue throughout the producing life of the field. Depending on the size of the field and the reservoir characteristics, the fields are expected to produce for 15 to 30 years.
- Unusable drilling muds and cuttings will be stored temporarily in reserve pits located on the pad. As wells are completed, this material will be transported to a disposal site. The reserve pit may then be filled in or may be used to provide containment for fluids if problems arise during drilling.

Airstrips, Pipelines, and Roads

- Because the fields are remote from existing infrastructure, it is doubtful that a road would be built parallel to the pipeline. Therefore, extensive use of aircraft would be necessary to build, access, protect, and monitor the system. The airstrips built during the exploratory drilling stage would be upgraded and maintained year-round for the life of the field. The minimum length of the airstrips would be 6,000 feet and minimum width would be 150 feet. Each airstrip would occupy a 20-acre area and the adjacent taxiway, apron, support facilities, and staging area would cover an additional 15 to 30 acres. Approximately 300,000 cubic yards of gravel would be required to construct each airport facility.
- Well pads would be connected by spur roads to a primary road leading to the airstrip and processing facilities. All roads would be built with a crown width of 35 feet and would be 5 feet thick (approximately 40,000 cubic yards of gravel per mile to construct). Total road mileage would depend on size and surface features in the development area, but would probably range from 30 to 40 miles.
- Gathering lines would run from each production pad to the central production facility. Parallel sets of pipelines (one for crude oil, one

for gas, and one for water) would be placed on steel vertical support members adjacent to the road system in the field. Collector pipe diameters would range from 3 to 12 inches and would be routed along roads.

- An 8 to 16 inch diameter elevated pipeline (main production pipeline) would be built across refuge and private lands (approximately 220 to 250 miles, depending on production field location and pipeline route) to the Trans-Alaska Pipeline System facilities at the Yukon River crossing.
- Pipeline construction would take approximately two years and would employ about 250 workers.
- The pipeline right-of-way would be approximately 20 feet wide and would be cleared of vegetation. The right-of-way would be revegetated after construction.

General

- Borrow material for the construction of the various facilities would be mined from the flood plains of nearby rivers and streams or from excavation of each pad's reserve pit.
- Environmental guidelines and additional restrictions imposed by the refuge manager in the special use permits and approved plan of operation would apply to all operations. Drilling would be restricted to times when disturbances to fish and wildlife could be minimized.

Field Termination

Once oil and gas are depleted within the fields, the wells would be plugged and abandoned, the facilities removed, and all disturbed surfaces reclaimed as directed in federal regulations.

Biological Effects of Alternative B (Life of the Plan - 15 Years)

Vegetation. Over most of the refuge, changes in vegetation would continue to be primarily the result of natural events, such as flooding and wildfire, and as a result of naturally occurring successional changes.

Alternative B allows the most potential manipulation of vegetation (habitat improvement) of all the alternatives. Many of the successional changes under this alternative would be human-controlled. Prescribed burning would be allowed throughout the refuge while other forms of habitat improvement (such as mechanical manipulation and water impoundments and diversions) could occur on 68 percent of the refuge. Prescribed burning, however, is the most likely form of habitat improvement on the refuge and is the only technique proposed by the refuge staff (10,000 to 20,000 acres burnt on a biannual basis with four burn areas currently identified). Commercial timber harvest would also be permitted under this alternative (no more than 20 acres of refuge lands per year would be harvested, although permitted on 68 percent of the refuge). Construction of the main production pipeline from the oil fields would result in clearing of some 320 acres (along a 20-foot right-of-way, approximately 160 miles on refuge lands). A set back in plant succession would result from these activities, although the acreage involved is negligible. Agricultural development (although not likely to occur) it would be permitted on 22 percent of the refuge and would result in a complete change in successional patterns. Herbaceous and shrubby plants invading an area after disturbance offer abundant forage to species such as moose and many rodents. The effects of this human-caused disturbance on succession would be

off-set, in part, by the increased fire control activities necessary to protect new developments in the area of the refuge under intensive and moderate management.

In addition to the temporary impacts on vegetation caused by reversals of succession, some fairly permanent impacts would be expected in localized areas of the refuge. Oil and gas leasing and associated development activities may be allowed, if compatible, on 68 percent of the refuge. Construction, gravel fills, and oil spills which may result essentially remove land from primary plant productivity in localized areas (500 to 1,000 acres of direct loss would result from development of each oil production field in the scenario). Mining activities, as described in the scenario, would result in the disturbance of less than 10 acres per year, a negligible and very localized impact.

Seismic activities would be permitted throughout the refuge. Some crushing of vegetation would occur along seismic lines, although these impacts would be limited with state-of-the-art techniques being used and activities confined to the winter. Crushing would result in a set back in succession in those localized areas where activities occurs. Impacts to vegetation from seismic activities would be negligible.

Wildlife. General Wildlife Impacts--Alternative B could have major effects on wildlife habitats and populations. The extent of impacts would depend on the success of seismic activities and subsequent oil and gas leasing and the amount of other economic activities (including mining and timber harvest) and public use which may occur on the refuge. Assuming a significant find of oil and gas (see the oil and gas scenario), diversity of refuge habitats could decrease due to the loss of habitat associated with development. Wetlands would likely be hardest hit since a greater proportion of the wetlands habitat would be open to oil and gas development than upland and mountainous habitats. Total populations of wildlife would likely be affected with wetland-associated wildlife bearing the brunt of the negative impacts since the wetland area would be most altered.

Waterfowl--Prescribed burning would be allowed throughout the refuge. Under the scenario for this alternative, four prescribed burns are identified. Each burn would cover 10,000 to 20,000 acres with burns scheduled on a biannual basis. Depending on the success of the burns in meeting their objectives, additional burn areas could be identified and the burning program could continue beyond these initial burns. Waterfowl would be affected differently depending on location and design of the burns. In areas of the refuge where lakes and ponds are low in nutrients, prescribed fire could result in the release of nutrients as ashes are leached by surface runoff and as groundwater flow increases with retreat of permafrost in burned areas. As nutrient content increases in these lakes and ponds, they would improves as waterfowl habitat. Prescribed burns could, in turn, result in localized minor impacts to waterfowl production through the loss of nesting habitat and increased siltation in areas where production is currently high. Overall, impacts to waterfowl from prescribed burning would be negligible. Other habitat improvement techniques (such as mechanical manipulation and water impoundments and diversions) could be undertaken on 68 percent of the refuge. No projects using these techniques, however, have been identified for implementation on the refuge.

Waterfowl populations and the wetlands habitats they use could be significantly affected in this alternative if seismic activities lead to the development of oil and gas resources. Over 75 percent of the wetland habitats on the refuge are within the area where leasing may be allowed. Seismic activities could occur throughout the refuge.

Impacts of oil and gas development vary with the activity phase. Geologic mapping, surface rock sampling, and shallow core drilling would be expected to have negligible impacts on waterfowl. Seismic surveying, resulting in impacts similar to those discussed in Alternative A, should have negligible effects on waterfowl assuming surveying work occurred during winter when waterfowl are absent or state-of-the-art air-transported seismic equipment is utilized. Although negligible, impacts could be more extensive as opening areas of the refuge to leasing could stimulate seismic activities. If such activity was not restricted, resulting impacts could be significant.

Swans, loons, and cranes are extremely sensitive to noise and visual disturbances during nesting and molting. These disturbances can result from seismic activities, leasing, and development. Waterfowl could be frightened off nests, exposing eggs and young to weather and predation (Barry and Spencer 1976, Owens 1977, Simpson et al. 1982). Continual harassment can lower reproductive success and cause birds to abandon key habitat in favor of less suitable, more isolated sites (Gollop et al. 1972, USDI-BLM 1976, Gavin 1980).

Ducks and geese molting in the late summer or staging in spring and fall are also sensitive to disturbance. Molting and staging are periods of great physiological stress and high energy demands. Additional stress and high energy demands caused by human disturbances could retard growth of flight feathers or intake of food, delay migration south, and adversely affect survival (Simpson et al. 1982; Hanley et al. 1983). Whether disturbance occurs on breeding or staging grounds, it can directly or indirectly lower reproduction and survival rates for the duration of the activity. Without stringent environmental controls, traditional spring and fall migration and staging areas could be abandoned.

Construction and production phases of oil field development would affect waterfowl both directly and indirectly. Direct habitat losses (approximately 500 to 1,000 acres per field, 320 acres along the main production pipeline) would result from construction of the central production pad, drill pads, pipelines, and other facilities. Gravel extraction from stream beds, construction of access roads and pipelines, the central production pad, drill pads, and air strip, and disposal of drilling muds could degrade water quality in streams, ponds, and wetlands used by waterfowl. Construction and traffic on pads and access roads may create dust that could affect water quality and quantity and aquatic vegetation. This, in turn, could affect the waterfowl food supply in localized areas. Alteration or reduction of stream flows or surface drainage patterns resulting from construction activities would also affect waterfowl. Less permanent sources of disturbance would be caused by field crews, blasting, and drilling.

Disturbance effects would probably decrease during the production phase, when field crews are smaller. However, these impacts would be more prolonged. During production, noise caused by diesel and turbine engines in pumps, compressors, generators, and drilling equipment, as well as in ground vehicles and aircraft, may disturb wildlife (on more than 50,000 acres around each production field, over 100,000 acres along the main production pipeline).

In addition, oil field development has the indirect effect of improving access and, thus, the opportunity for harvest of waterfowl.

In Alternative B commercial timber harvesting could occur on 68 percent of the refuge (moderate and intensive management), agricultural development and other economic uses could occur on 22 percent of the refuge (intensive management), and recreational use of the refuge is encouraged (projected to increase as much as 100 percent, 1,000 visitor use days). These activities, if they were to occur, would also result in impacts to waterfowl, similar to

the impacts associated with oil and gas development. Loss of habitat could occur, water quality could be degraded, and other impacts related to disturbance could occur. Commercial timber harvest along the Yukon River (as described in the scenario) would result in negligible impacts, primarily from the transportation of logs down the Yukon to Fort Yukon.

Mining activities, limited to a very small area of the refuge (less than 10 acres per year), would result in negligible impacts to waterfowl. Some direct habitat loss would result and indirect impacts, primarily the result of noise generated by mining activities, would occur in a small area (no more than 8,000 acres) surrounding the mining site. Because miners tend to live at the mining site for an extended time, increased harvest may occur. However, this increased harvest would be very small and highly localized, resulting in only negligible impacts to the waterfowl population on the refuge.

Moose--Alternative B would have generally more mixed impacts on moose than on waterfowl. Since maximum moose forage is usually found in early successional stages, any activity which sets succession back would generally benefit moose. Prescribed burning, as outlined in the scenario for this alternative, would occur on at least four areas of the refuge (with burns covering 10,000 to 20,000 acres each). Burns would occur on a biannual basis. The primary objective of the burns is to improve moose habitat (eventually increasing the moose population on the refuge) through the set back in plant succession on these sites. In addition, negligible benefits would result from disturbance of vegetation resulting from seismic activities (limited crushing along some 360 to 480 miles of seismic lines over a three year period), clearing of the main production pipeline right-of-way (320 acres), and commercial timber harvest (20 acres of timber would be harvested from refuge lands annually, although 68 percent of the refuge would be open to commercial harvest).

Offsetting the positive aspects of increased moose forage produced under Alternative B would be the negative impacts on moose associated with increased human activity. Increased economic activities (including mining and commercial timber harvest), improved access, and encouragement of recreational use (projected to increase up to 100 percent or 1,000 visitor use days) translate into increasing human use and potentially higher moose harvest levels. Cooperation with ADF&G in monitoring moose populations and regulating harvest levels would be necessary to prevent overexploitation of the resource. In addition, there would be some direct loss of habitat caused by oil and gas development (500 to 1,000 acres at each production field), mining (less than 10 acres annually), and other areas of development on the refuge.

Caribou--Oil and gas development allowed in Alternative B could affect caribou populations, migration patterns, and habitat use on the Yukon Flats Refuge. Although most of the refuge lies within the range of both the Forty Mile and Porcupine herds, neither herd includes the area as part of their center of habitation (Skoog 1968). Historical records suggest that use of the Yukon Flats increases with herd size (Skoog 1968, Davis et al. 1978).

As with other harvestable wildlife species, improved access and increasing use of the refuge for economic and recreational activities (recreational use projected to increase up to 100 percent or 1,000 visitor use days) would potentially increase harvest levels. Cooperation with ADF&G in monitoring caribou populations and regulating harvest levels would be necessary to prevent overexploitation of the resource. Herd behavior, high visibility, and relatively low reproductive rates seem to make caribou particularly susceptible to overharvest.

Research on the Central Arctic herd, whose range includes the extensive Prudhoe Bay oil field and the northern extension of the Trans-Alaska Pipeline, suggests some sensitivity of caribou to disturbance. Pregnant cows and cows with new calves seem to be especially intolerant of disturbance (Cameron 1983). In addition, there are both direct habitat losses and indirect habitat impacts resulting from oil field developments. The extent of this loss depends on the size of the development (approximately 500 acres of direct habitat loss would result at each production field, 50,000 acres or more of indirect habitat impacts would occur in each production field). Direct and indirect habitat loss can also occur as a result of commercial timber harvest, mining, and other activities permitted in this alternative.

Bear--The intensive development allowed in Alternative B would likely result in an increase in bear/human conflicts which often result in the death of bear. Impacts resulting from the presence of humans are discussed under Alternative A. These impacts would be of longer duration or would be more widespread if oil and gas development occurs, if other economic activities (such as timber harvest and mining) occur, and/or if recreational use increases as projected (up to 100 percent above current levels). In addition, improved access and increased human use of the refuge would result in increased hunting pressure on bears.

Furbearers--Increased human activity would affect furbearer populations and habitats to a limited extent. Some direct habitat loss would occur in areas where development occurs (e.g., oil fields - 500 to 1,000 acres at each production field - and placer mines - less than 10 acres per year). Prescribed fire (four burns of 10,000 to 20,000 acres to be burnt biannually) and clearing of vegetation along the main production pipeline (320 acres) would result in greater habitat diversity (more edges) which could support higher densities of prey species. Other activities which could occur under this alternative, such as commercial timber harvest (on 20 acres annually) and agricultural development (not projected to occur), could also result in greater habitat diversity. Improved access could allow for greater human use in some areas of the refuge, thus resulting in increased trapping pressure. Overall, impacts would be localized and negligible in extent.

Peregrine falcon--Peregrine falcon nest sites are present within the intensive and moderate management zones in Alternative B. Peregrines are sensitive to disturbance around their nest sites. Increased aircraft travel associated with oil field development and other economic, recreational, or management activities may disturb the birds unless special management actions are taken as outlined in the Peregrine Falcon Recovery Plan (USDI-FWS 1982b). See Wildlife Management discussion under Management Directions Common to All Alternatives in the Management Alternatives chapter for a discussion of mitigation measures to limit impacts to peregrine falcon.

Fishery Resources. Alternative B could potentially result in significant impacts to the fisheries resource. Impacts on refuge fisheries would be the result of increased use by recreationists and personnel employed in oil and gas exploration (allowed throughout the refuge), leasing activities (allowed on 68 percent of the refuge if compatible), and other economic and management activities permitted under this alternative, and by direct impacts on water resources and fish habitats. Recreational use is projected to increase up to 100 percent under this alternative, an increase of 1,000 visitor use days. Increased accessibility of fishing areas may result in major impacts.

Overland travel, stream crossings, extraction of gravel, pad and road construction, and other activities associated with oil and gas exploration and

development can result in major impacts on fishery resources. These development-related activities change fish habitat by disturbing the soil surface, increasing erosion, altering soil thermal regimes, altering drainage patterns, increasing water consumption, increasing stream turbidity, and increasing thermokarst, icings, ponding of water, and flood hazards. Since oil and gas exploration and development activities should closely follow the environmental guidelines outlined in the scenario, fishery habitat alterations would be limited, in most instances, to negligible impacts, although some impacts would be unavoidable and would still occur.

Gravel extraction and washing activities, in particular, could result in significant impacts on fish habitats. Over 1,000,000 cubic yards of gravel would be required for construction of well pads, roads, airstrip, and other infrastructure at each production field. Potential impacts resulting from gravel extraction and washing operations could include rechannelizing streams and tributaries, increasing surface runoff and siltation, altering (or destroying) spawning and overwintering habitats, creating barriers to migration, and creating entrapment hazards for adult and juvenile fish. Fish could also be adversely affected by dredging and filling activities in wetlands and non-contiguous waterbodies adjacent to rivers and streams. Construction of the oil pipeline could potentially affect all salmon and resident fish populations in the rivers and streams within or peripheral to the pipeline right-of-way. Burying sections of the pipeline in or near waterbodies could result in cutting of banks and bottom materials, creating downstream siltation and thus potentially affecting any downstream fish species.

Sewage effluent at campsites would be expected to result in localized moderate impacts through the addition of organic nutrients to aquatic habitats. These impacts are discussed under Alternative A, although the potential for significant impacts would be greater as the level of activity on the refuge and number of people involved increases under Alternative B (e.g., oil and gas leasing and development, commercial timber harvest, and mining). Recreational use is also encouraged (although not expected to be significant in total use, an increase of up to 100 percent is projected), which could add to these impacts by increasing the level of sport fishing in localized areas. Oil spills could also occur with potential moderate impacts as discussed under Alternative A.

Byproducts of oil production could have a moderate impact on fisheries. Solid waste disposal in the refuge area would result in leaching of organics and metals into the active soil layer and water, thus adversely affecting water quality. Salt water incidental to oil production would tend to increase the salt concentration of water in local areas and negatively impact fisheries. Reserve pits, used for storage of drilling muds and cuttings and produced salt water, are also expected to cause a moderate impact in local areas by leaching into the active soil layer and waterways. In addition, reserve pit fluids may be discharged, either directly onto the surrounding lands or indirectly onto roads. Over 90 million gallons of reserve pit fluids were discharged in both 1984 and 1985 in the Prudhoe Bay-Kuparik area. These discharges continue to affect the water quality of the area. With similar precipitation rates occurring on the Yukon Flats as in the Prudhoe Bay area, discharge of reserve pit fluids would be expected if development occurs - the amount of such discharge being dependent on the size and extent of development.

The increased dust level in construction areas could hasten the snow pack melt rate. The resulting increase in stream flow and associated erosion of stream banks could have moderate impacts on refuge fisheries.

Domestic water use would increase (75-200 gallons per person per day) causing moderate localized impacts through the potential depletion of available fresh water ponds. In addition to domestic use, drilling activities require large quantities of water. For example, an average of 1.7 million gallons of water is required to drill shallow wells and 8.4 million gallons of water is required to drill deep wells. Such water use could have major impacts on fishery resources through the depletion of ground and surface water in areas near drilling sites (Silvestro, 1979).

Commercial timber harvest (allowed on 68 percent of the refuge) could result in impacts to fishery resources through increased erosion and stream turbidity resulting from the disturbance of soil surfaces. However, the level of harvest activity anticipated on an annual basis would directly impact less than 20 acres of refuge lands with negligible impact on waterways other than the Yukon River. Some minor impacts would result to fishery habitats from the utilization of the Yukon River for transportation of logs from the harvest site downstream to the mill site at Fort Yukon.

Increased subsistence use of fish for humans and to provide food for sled dogs could result in minor impacts on the refuge, but may cause major impacts in localized areas.

Habitat improvement activities would have only a minor or negligible impact on fish. Although techniques such as mechanical manipulation and water impoundments and diversions would be allowed on 68 percent of refuge, prescribed burning would likely be the only technique used on the refuge. Four prescribed burning projects have been identified in the scenario, each of which would cover 10,000 to 20,000 acres of refuge land. Prescribed burning would be monitored and the impacts, if any, should be minor if burns occur as described in the scenario. Increased siltation and water temperatures are the major effects of fire on fish and other aquatic organisms. Very little surface erosion occurs on burned sites in interior Alaska except where heavy equipment is used for suppression (AIFMC 1982). If prescribed burns should escape (become wildfires), then they could potentially remove stabilizing vegetation from stream banks or steep watersheds potentially causing accelerated erosion, leading to increased turbidity and stream sedimentation, severe braiding, and increased water velocity. This may prevent fish from spawning and feeding in such areas. Projects would be designed and initiated so that the fishery resource should not be adversely affected.

Agricultural development, if it were to occur, would result in impacts similar to habitat improvement activities. In addition, water would be needed for irrigation. Chemical fertilizers, insecticides, and herbicides would also be necessary. Water quality and quantity could be adversely affected, thus affecting fishery resources.

Increased regulation of fishery resources by the Alaska Department of Fish and Game (ADF&G) in accessible areas and close monitoring of fish populations by the Service is expected to keep impacts on fisheries at not more than moderate levels.

Water Quality and Quantity. Numerous activities that could result in significant impacts to water quality and quantity would be permitted on the refuge under the management direction proposed in Alternative B. Some 22 percent of the refuge would be open to agricultural development while habitat improvement techniques (such as mechanical manipulation and water impoundments and diversions), oil and gas leasing and associated development activities, and commercial timber harvesting may be permitted on 68 percent.

Oil and gas exploration, including seismic activities, and prescribed burning could occur throughout the refuge.

These activities would result in clearing vegetation, leveling of sites, extraction and washing of gravel, and other earth work. Undertaking any of these actions on the refuge could result in increased soil compaction, soil erosion, surface run-off, and siltation of nearby waters. Surface and subsurface hydrologic regimes could be altered or obstructed. Construction of roads, primarily in association with oil field development, could lead to stream constriction and siltation at waterway crossings and the resulting soil compaction (or improper culvert placement) could cause pooling along the uphill side of the roadbed. Water quality could also be impaired by dust from road traffic, increased sedimentation from burying sections of the pipeline in or near waterbodies, leaching from sanitation facilities, introduction of toxic drilling fluids, or accidental petrochemical spills. Water withdrawals for personnel (75-200 gallons per person per day) and leasing activities (e.g., 1.7 million gallons for drilling shallow well, 8.4 million gallons for drilling deep well, injection which requires several thousand gallons per day) could deplete ponds and streams adjacent to these areas (Silvestro, 1979). Even with stringent regulations major localized short-term impacts on water quality and quantity could result from these activities.

Seismic surveying activities may result in minor, localized impacts on water quality. Siltation could result from use of explosives along shot lines. Stream crossings by seismic crews could damage streambanks and streambeds, although limiting seismic activities to winter would limit potential impacts. Any alteration of stream hydraulics, hydrology, and deposition patterns could degrade water quality by increasing sedimentation or changing water chemistry. If air-transported seismic equipment is used and clearcutting of vegetation is not done (as outlined in the scenario), impacts from seismic activities would be negligible.

Because mining and commercial timber harvest activities would be very limited under this alternative (less than 10 acres involved annually under the mining scenario and less than 20 acres under the timber harvest scenario), potential impacts resulting from removal of vegetation and soil scarification would be localized and negligible in extent.

Public use of the refuge is encouraged under Alternative B. If current levels of use do not change significantly (projected increase in recreational use of up to 100 percent, or 1,000 visitor use days, would not be a significant increase in total public use), water quality would not be significantly affected. However, should public use increase more than is expected, water quality and quantity could be affected through increased consumption, increased human and off-road vehicle traffic along and through streams, improper disposal of garbage and human waste at campgrounds, and increased erosion and dust.

Alternative B could result in major long-term effects on refuge water quality and quantity in localized areas of the refuge. Many potential impacts, however, can be minimized by avoiding waterbodies whenever possible, by implementing site-specific mitigation measures (as in the scenarios), and by increasing water quality monitoring in areas near all development facilities and economic activities. Overall, water quality on the refuge would experience only minor, long-term impacts with proper control over use.

Visual and Air Quality. Visual and air quality on the refuge could be adversely affected by various activities permitted under this alternative. Seismic activities, if carried out using state-of-the-art helicopter-transported equipment and without having to clear shot lines (as described in

the scenario), would result in negligible short-term visual impacts. Prescribed burning could occur throughout the refuge. If burns are carried out as proposed they would simulate wildfires, thus limiting any visual impacts. Short-term impacts to air quality would result from prescribed burning, but wind conditions should be such that smoke will not be directed at nearby villages or other areas of development. Mining activities would have localized impacts to both visual and air quality, the result of clearing and excavation activities.

Sixty-eight percent of the refuge may be open to oil and gas leasing and associated development (the oil and gas scenario assumes two production fields and a 250 mile pipeline - 160 miles on refuge lands - would be developed), habitat improvement techniques such as mechanical manipulation and water impoundments and diversions (none proposed), and commercial timber harvest (less than 20 acres would be cut annually under the scenario). Construction of roads and visitor facilities, agricultural development, and other development activities (which result in the disruption of vegetative cover and disturbance of soils) could occur on 22 percent of the refuge, but are not likely within the life of the plan. These activities could result in the placement of permanent or temporary structures into the landscape. Dust and other air pollutants would also be evident, particularly during construction or while activities are underway. In some cases, such as with roads and oil fields, localized long-term air quality impacts could occur. Significant impacts to visual and air quality on the refuge, both short and long-term, would likely occur if permitted activities are undertaken on the refuge. Utilization of landscape design principles and other mitigation measures would reduce the impacts of these activities on visual and air quality, but would not eliminate the impacts entirely.

Overall, implementation of Alternative B would result in moderate impacts to visual and air quality in areas of the refuge where development would occur.

Socioeconomic Effects of Alternative B (Life of the Plan - 15 Years)

Population. Public use of the refuge is encouraged in this alternative, although such growth is not expected to be significant. Public facilities, such as campgrounds and visitor contact stations, could be built and access could be improved by construction of roads. However, levels of use necessitating construction of such facilities would not be expected to occur. An increase in the number of recreational users would be expected (projected to be as much as 100 percent, or 1,000 visitor use days), although growth over the next 10 to 15 years would be very slow. Primarily summer users, this population would be of a transient nature.

A number of economic activities would be permitted in this alternative. Oil and gas exploration (including seismic) and leasing activities, in particular, could significantly influence both transient and permanent populations of communities on the refuge. Oil and gas exploration, focusing on seismic surveying, would utilize a transient work force. Surveying work would be undertaken over a three year period, primarily during the winter, with a crew of 20. Should leasing and associated development occur, a permanent work force would be required. This work force would have a more significant, long-term impact on the population of refuge communities. Communities in the vicinity of development activities could be severely affected by an influx of new residents; or new "communities" could be built.

Exploratory drilling activities would occur over two winter seasons. Three wells would be drilled with a crew of 60 (including rig crew and support personnel) required for each well. At each production field, on-site housing would be developed to house 150 to 300 employees for the life of the field. An additional 250 people would be employed during construction of the production pipeline. The greatest population increase would be temporary (less than five years) and would occur during the construction phase of development. Other economic and development activities could affect the population of refuge communities, but not to the same extent as oil and gas exploration and gas leasing. Commercial timber harvest, mining, agricultural development, and other economic and management activities would utilize a work force consisting primarily of local residents.

Overall, Alternative B could potentially result in significant increases in both transient and permanent populations of the refuge, either in villages on or near the refuge or in newly created "communities."

Social Conditions. Social conditions on the refuge would be altered more by implementing Alternative B than any of the proposed alternatives. Road construction would be permitted on the refuge as would a number of economic uses and public facilities not permitted in other alternatives. Improved access between villages, although not anticipated, would result in increased interaction between communities if it were to occur. If roads constructed on the refuge tie into existing road systems off the refuge, a significant increase in public use would probably occur. Even without this tie-in, recreational use would be encouraged (although not expected to grow significantly) and economic activities, particularly oil and gas exploration, leasing, and development, would require a large number of seasonal and short-term workers (most imported from outside the region), as well as a permanent work force. With larger numbers of non-locals working on and using the refuge for various purposes, the interaction between locals and non-locals would increase substantially. The traditional lifestyle of local residents could be altered significantly with greater numbers of people using the limited resources of the refuge and economic activities altering habitats and changing the local economy. Mining and commercial timber harvest activities would employ a limited number of local residents.

Economy. Of the alternatives considered, Alternative B would have the most significant effect on the economy of refuge communities. Recreational use of the refuge would be encouraged (projected to grow up to 100 percent, or 1,000 visitor use days). Although such growth would not be a significant factor in total public use, it would have minor impacts on the economy of the region. As recreational use grows, demand would increase for recreation and other service-related needs (guides, lodging, food, transportation). Businesses supplying these services, and the communities in which these businesses are located, would benefit economically from the increased demand. A limited number of new jobs, primarily seasonal, could also be created.

A number of economic activities would be permitted on the refuge under this alternative which could benefit the local economy. Oil and gas exploration, leasing, and development, commercial timber harvest, mining, and other activities would create potential employment opportunities for local residents. Most of these jobs would be associated with oil and gas activities on the refuge, would be seasonal, and would continue for less than five years. If oil and gas leasing and associated development occur as described in the

scenario, several hundred jobs (both temporary and long term) would be filled of which at least a few would probably go to local residents. Although a large number of the jobs created would be filled by non-locals with wages being taken out of the region, many local service-related businesses would benefit. Businesses supplying food, lodging, transportation, construction services, and other services would benefit if these activities occur.

Additional economic benefits would result from oil and gas leasing and development. Revenue generated from leasing and royalties from production would be dispersed to federal, state, and local entities. These economic benefits could be significant, depending on the level of production.

Mining and commercial timber harvest activities, as described in the scenarios for this alternative, would provide a limited number of seasonal jobs for local residents.

Recreation. Recreational use of the refuge would be encouraged in this alternative (projected to grow up to 100 percent, or 1,000 visitor use days). Although construction of roads (improved access) and recreational facilities (campgrounds, visitor contact stations) would be permitted on part of the refuge, it is not likely that such facilities would be developed. The influx of seasonal and permanent workers associated with oil and gas exploration, leasing, and development could result in some temporary increases in recreational use, causing greater pressure to be placed on limited refuge resources. However, subsistence use on the refuge would remain the most significant factor in public use, accounting for more than 90 percent of the public use occurring on the refuge. The permanent work force associated with oil and gas activities would result in a steady rate of growth over the next 10 to 15 years, somewhat higher than in Alternative A, but still relatively slow. Recreational use would not be a significant factor in overall use.

Moose hunting, because of the current permit hunt on much of the refuge, would not increase significantly. A larger increase in other hunting and fishing activities would occur, particularly in the vicinity of the oil fields. This increase would result in greater pressure on refuge resources as well as affecting the traditional subsistence lifestyle of many local residents. Non-consumptive recreation activities, such as camping, hiking, and photography, would also increase, but at a very slow rate.

Cultural Resources. The management direction in Alternative B would allow a wide variety of activities to occur on the refuge, with potential adverse affects on cultural resources. Oil and gas exploration, leasing, and development, commercial timber harvest, mining, and other uses which may occur could potentially cause major damage to cultural resource sites on the refuge. Many of these activities would result in the excavation or disturbance of soil surfaces and could potentially cause damage to unidentified cultural resource sites. Whenever and wherever possible, the Service would avoid or minimize impacts to cultural resources through site-specific inventories and evaluations and by the use of mitigation or preservation measures.

Although public use of the refuge is not expected to increase significantly over the next 10 to 15 years, the work force required to undertake oil and gas activities under this alternative, plus slightly higher levels of public use, could result in localized minor impacts to cultural resources.

Overall, impacts to cultural resources would be minor under Alternative B provided site-specific inventories and evaluations are carried out and mitigation or preservation measures are used when necessary.

Subsistence/Section 810(a) Evaluation and Finding. The following section examines the impacts on subsistence that would result from implementation of Alternative B. It conforms to the guidelines recommended by the Alaska Land Use Council for complying with Section 810 of ANILCA.

Opportunities to participate in subsistence activities would not change significantly under Alternative B, but impacts on and competition for subsistence resources would increase. Depending on the extent of economic development and increasing recreational use, implementation of this alternative could result in significant impacts to subsistence use on the refuge. Oil and gas exploration, leasing, and development would have the most significant effect of any potential activity under this alternative. If development occurs as outlined in the scenario, a large number of oil and gas workers would be brought to the refuge for the various phases of development (exploratory drilling would require 180 workers for two seasons; 150 to 300 workers would be involved with development of the production fields; construction of the production pipeline would require another 250 workers for two years). Oil development at this scale would result in an increase in the number of people using the refuge and its resources. Other economic activities and potential construction projects (public facilities) could also occur on some areas of the refuge, using additional non-local workers. Since most of the refuge is used by local residents for subsistence activities, the use of the refuge and its resources by an imported work force would have a significant impact on subsistence use of the refuge, particularly through the increased competition for refuge resources.

Impacts to resources and habitats associated with subsistence use would be most evident in localized areas where specific activities were underway. Seismic activities would be permitted throughout the refuge. Generally occurring during the winter months, seismic activities would result in the displacement of wildlife and possible disruption of trapping activities for short periods of time in localized areas. Such impacts would be negligible. Prescribed burning is permitted throughout the refuge and would probably be the only form of habitat improvement used on the refuge. The prescribed burning scenario identifies four proposed burns. Additional burns could be planned beyond the initial projects. Mechanical manipulation activities, although none are currently planned, could be undertaken on 68 percent of the refuge. Habitat improvement activities would result in short-term impacts to certain subsistence species, but in the long term such activities would improve habitat conditions and be beneficial to many fish and wildlife species.

The various economic and recreational uses allowed in the intensive management area (22 percent of the refuge) could result in long-term impacts to subsistence activities. Development of oil and gas resources and commercial timber harvest (both allowed in 68 percent of the refuge), and other activities which may occur (e.g., sand and gravel extraction, campsite development) could result in long-term disruption of wildlife populations and habitats. Timing of construction activities and stipulations placed on special use permits would limit the extent of adverse impacts, but displacement of wildlife and disturbance or loss of habitats would still have minor impacts on resources taken by subsistence users. Hunters and trappers from Beaver, Birch Creek, Fort Yukon, and Chalkyitsik would be most affected. Subsistence fishing could also be affected, through impacts to water quality and fisheries habitats resulting from the various development activities.

Workers associated with these economic uses, coupled with a small increase in other recreational users (total recreational use is projected to increase up to 100 percent, or 1,000 visitor use days), would result in a moderate

increase in competition for the resources on the refuge. Although many of these people would be on the refuge only seasonally and for short time periods, their presence would intensify the concerns of local residents about overuse of the resources and interference with their subsistence activities. Increased access, more people, increased potential for crowding and trespass, and additional pressure on the resources would increase the perception of local residents that their subsistence way of life is being threatened.

In association with increasing economic and recreational use of the refuge, some improvement in access would also occur. Road construction, although not anticipated except for that associated with oil and gas development, could occur in intensive management areas of the refuge. With improving access, resource use would be easier, benefiting the subsistence user at least over the short term. In the long term, depletion of resources could result as improved access would concentrate use in specific areas and would encourage the participation of more people in the subsistence way of life.

Expenditures in support of oil and gas activities, increasing recreation use, and other activities could provide minor economic benefits to Fort Yukon and other local communities. Increasing economic and recreational use of the refuge would also create a limited number of new jobs for local residents. These benefits, however, would have only a minor impact because of their generally short duration. Alternative B would have little effect on the future subsistence needs of local residents. The subsistence lifestyle would continue to be extremely important to most residents.

Availability of Other Lands - Section 810(a) requires that the availability of other lands be considered in evaluating the effect of refuge management alternatives on subsistence uses. This plan is a refuge plan by definition and addresses the general suitability of a broad range of activities for refuge lands. Thus, though other lands may be available for the uses considered, lands outside of the refuge are not considered because they are beyond the scope of this plan.

Other Alternatives - Consideration of other alternatives is also required by Section 810(a). Five management alternatives have been analyzed for the Yukon Flats Refuge. Alternative B would allow oil and gas development and commercial timber harvest on 68 percent of the refuge. Other economic uses and a number of public facilities would be permitted on 22 percent of the refuge. Although opportunities to participate in the subsistence lifestyle would not be significantly altered, improved access, increased recreational use, and more economic development would result in long-term impacts to subsistence resources and activities and increased concern by local residents that their subsistence lifestyle would be threatened.

Alternative A, the Current Situation, has few impacts on the subsistence way of life. All refuge lands would be classified as minimal management. Alternative D, the Service's preferred alternative, and Alternative E are similar to Alternative A in that all refuge lands would be classified as minimal management. They differ from Alternative A in that lands would be proposed for designation as wilderness (eight percent in Alternative D; all refuge lands in Alternative E). In these alternatives, opportunities to participate in subsistence activities would be maintained and implementation would have negligible effects on the subsistence way of life, although the presence of seismic crews seasonally on the refuge may intensify concerns of local residents about overuse of the resources and interference with their subsistence lifestyle.

Alternative C may open about one fourth of the refuge to oil and gas leasing and development, resulting in localized, long-term impacts to resources taken by subsistence users. Although opportunities to participate in subsistence activities would not be affected, the presence of oil and gas workers on the refuge would intensify the concerns of local residents about overuse of the resources and interference with their subsistence lifestyle.

Other alternatives were considered during early stages in the planning process. Many of these alternatives fell within the range of alternatives which are evaluated in this document and would result in variations of the impacts discussed previously. Other alternatives opened more of the refuge to development of public facilities and economic uses. These alternatives were determined not to meet refuge purposes as outlined in ANILCA and were, therefore, not evaluated further in this document.

Finding - Implementation of Alternative B could result in significant impacts to refuge resources and increasing competition for the limited resources available on the refuge, thus potentially resulting in a significant restriction of subsistence use on the refuge.

Wilderness Designation Effects of Alternative B (50 Years)

In Alternative B, no lands on the Yukon Flats Refuge would be proposed for wilderness designation. The refuge would be managed under three management categories - 22 percent under intensive management, 46 percent under moderate management, and 32 percent under minimal management. Areas of the refuge could be developed for increased public use or economic uses that might not protect wilderness values, but would be compatible with refuge purposes.

Impacts on Area not Proposed for Wilderness

Effects on Wilderness Values. The following section describes the effects of not designating any of the Yukon Flats Refuge as wilderness.

Naturalness - Activities which would be allowed on the refuge and which could affect naturalness in the short and long term include oil and gas exploration, leasing, and development, placer mining, commercial timber harvest, and prescribed burning. Core drilling and seismic exploration, although allowed throughout the refuge, would most likely occur in the area of the refuge identified as having moderate potential for oil and gas discovery (68 percent of the refuge, see Figure 7). These activities would occur during the winter. Crushing of vegetation would occur along the 360 to 480 miles of seismic lines (within a 20 foot right-of-way, less than 1,000 acres) and in a small area at each core drilling site (less than one acre per site). Sensitive wildlife, primarily wolves and wolverines, would be displaced from the area of seismic activities and core drilling while these activities are occurring. Most other species sensitive to disturbance (e.g., swans, bald eagles, peregrine falcon, ospreys, and grizzly bears) would not be present during the winter months. Visual impacts would also be evident as people (50 or less) and equipment would be present in the project areas and crushing of vegetation would occur. Because of the short duration during the winter when these activities would occur and the small area involved, any impacts to the naturalness of the refuge would be short-term and negligible.

Oil and gas leasing and development could also occur under this alternative (on up to 68 percent of the refuge). It is projected that three exploratory

wells would be drilled and two producing oil fields would be developed (see oil andgas scenario). A large number of people would be involved in these activities and numerous facilities would be constructed. For each production field, an airstrip and staging area, central production facility, housing, up to six drill pads, and associated pipelines and roads would be required. As many as 300 people would be involved with drilling and production of oil from each field, while smaller temporary crews would be involved with pipeline construction and drilling of exploratory wells. Development of the production fields would adversely affect the naturalness of the project area and its surroundings - over 50,000 acres at and surrounding each of the production fields. Direct loss of habitat would occur on 500 to 1,000 acres at each field due to surface disturbance, while visual impacts related to the presence of facilities and people would effect up to 8,000 acres. Several factors would adversely affect the perceived naturalness of the area surrounding the production field (up to five miles from the field): the noise generated by equipment and motorized vehicles; increased air traffic required to transport personnel, equipment, and supplies to and from the production fields; potential changes in water quality and quantity resulting from withdrawal of water for production activities and personal use, leaching and/or discharge of organics, metals, and salts from solid waste disposal sites and reserve pits, and other development related factors (see Fishery Resources and Water Quality discussions under this alternative for additional detail); and displacement of wildlife (those species which are particularly sensitive to disturbance such as swans, bald eagles, peregrine falcon, ospreys, grizzly bears, wolves, and wolverines would be most affected although most species would be displaced from the actual areas of development). One proposed production field would be in the Black River Unit; the other would be in the Flats Unit. Construction of the main production pipeline (250 miles in length of which 160 miles would be on refuge lands) would result in the clearing of vegetation from a 20-foot right-of-way (approximately two acres per mile of direct impact, 320 acres maximum). The pipeline would effect the naturalness of an area extending one half mile in either direction from the right-of-way, an area of more than 100,000 acres over the route of the pipeline.

Placer mining activities on the refuge are expected to increase in the future (see mining scenario). The mining activity itself would involve less than 10 acres of land per year (for excavation of mineral bearing gravels and for storage of overburden). Mining activities would utilize significant quantities of water (approximately 1.1 cubic feet per second when mining is occurring, depending on the mining method used) from adjacent streams (settling ponds would be constructed and water recycled to the maximum extent possible). Support facilities (such as a bunkhouse/cookhouse, workshop, storage facility for equipment, unimproved roads) would be required. Surface disturbance would occur and facilities and people (during the summer mining season, approximately four months) would be present on the mining site and its immediate surroundings (an area of less than 100 acres, including already mined areas) within the Sheenjek/Porcupine Unit. In addition, noise from equipment and motorized vehicles and displacement of sensitive wildlife would adversely affect the naturalness of the area surrounding the mining operation for a radius of up to two miles (8,000 acres). Potential changes in water quality (increased sedimentation and possible heavy metal contamination of streams if waters are returned without adequate treatment) and quantity could affect water for many miles downstream of the mining site, although such impacts would not occur if compliance with state water quality standards is enforced.

Commercial timber harvest activities would be permitted on up to 68 percent of the refuge under this alternative. However, timber harvest is anticipated to occur on only 20 acres annually (see commercial timber harvest scenario). This acreage would be located along the Yukon River between Fort Yukon and Circle City in the Flats Unit. Removal of timber from up to 20 acres (in one acre clearcut blocks or strips), addition of temporary structures to the landscape, the noise from motorized equipment, and the temporary displacement of sensitive wildlife (such as wolves, wolverines, and waterfowl) would adversely affect the naturalness of the area. Such impacts would be most evident at the time of harvest (winter) and during the time when trees are removed from the harvest site (after spring break up). An area of 100 acres would be most directly affected, however a larger area - up to a two mile radius (8,000 acres) around the harvest area - may be indirectly affected by these impacts.

Prescribed burning projects (four burns of 10,000 to 20,000 acres each, to be burnt on a biannual basis) would have little effect on the naturalness of the refuge. Burn sites would appear generally the same as if a wildfire had burnt the site. Wildfire is considered a natural part of refuge ecosystems.

Outstanding opportunities for solitude - Recreational use of the refuge is not expected to grow significantly (up to 100 percent for a total of 2,000 visitor use days annually). However, much of this use would be by people involved in oil and gas exploration and development and would be concentrated in the area surrounding the production fields. A small number of people (50 for core drilling, less for seismic activities and mapping) would be involved in oil and gas exploration activities on the refuge. With these activities occurring primarily during the winter, opportunities for solitude for the wilderness user on the refuge would not be affected as a result of oil and gas exploration activities.

Oil and gas development, including drilling of exploratory wells, construction of production facilities for two oil fields (500 to 1,000 acres directly affected at each field), and construction of the main production pipeline (320 acres directly affected), would result in impacts to opportunities for solitude. The number of people necessary to complete exploratory drilling (180 people over two winter seasons), production field development (150 to 300 people during construction and production phases), and main production pipeline construction (250 people for two years) coupled with increased noise from equipment and motorized vehicles on-site and from aircraft traveling to and from the sites would have a significant impact on opportunities for solitude, particularly in an area surrounding the project sites - for a radius of up to five miles (50,000 acres around the production fields and for a distance extending one half mile either side of the main production pipeline - over 100,000 acres - during pipeline construction).

Mining activities and commercial timber harvest would occur at levels higher than at the present time. However, the limited extent of both mining and timber harvest (considering noise and sight impacts less than 8,000 acres would be adversely effected by either activity), the seasonal nature of the activities (summer for mining, winter for timber harvest), and the low number of people involved (no more than three for mining, four for timber harvest) would result in only a small degree of disruption to opportunities for solitude on the refuge.

Recreational use is anticipated to increase by as much as 100 percent over current levels. However, contact between refuge users would remain low and

opportunities for solitude would not be diminished. Users during hunting season might occasionally encounter other parties, although hunting restrictions would still limit the number of licenses issued in a large area of the refuge (see Figure 14). Except for limited contact along major river systems outstanding opportunities for solitude would be available throughout much of the refuge.

Outstanding opportunities for primitive recreation - Oil and gas exploration activities (geologic mapping, 360 to 480 miles of seismic lines, core drilling) would occur primarily during the winter, require low numbers of people to accomplish (50 or less), and would be limited in duration and extent. Opportunities for primitive recreation would not be affected.

Oil and gas development, including exploration wells, production facilities, and the main production pipeline, would reduce opportunities for primitive recreation in the immediate project area (500 to 1,000 acres per production field, 320 acres in the pipeline right-of-way) through the direct impacts of people and facilities. The primitive recreation experience would be affected in an area extending up to five miles outward from the product fields (50,000 acres) due to noise from equipment and motorized vehicles, increased air traffic, and reduced hunting and trapping opportunities as wildlife is displaced from the project area. Similar impacts would occur along a strip extending one half mile either side of the pipeline right-of-way (over 100,000 acres), primarily during pipeline construction although some impacts would remain after the pipeline is operational. Some workers associated with oil and gas development would also recreate on the refuge, particularly in the vicinity of their work. This increase, coupled with other growth in recreational use, would result in a projected doubling of current recreational use (an increase of approximately 1,000 visitor use days annually). This growth in recreational use would result in a slight decrease in opportunities for primitive recreation, with most of the impact concentrated in the area surrounding the production fields (within a five mile radius of the field, an area of some 50,000 acres) and along the major waterways of the refuge.

Mining activities, such as the removal of overburden, construction of settling ponds, dredging operations, and facility construction, would eliminate opportunities for primitive recreation within the mining site (less than 100 acres) during the mining season (four months during the summer). The primitive recreation experience would be adversely affected in an area extending up to two miles outward from the project site (8,000 acres), due primarily to noise from equipment and motorized vehicles involved in the mining operation.

Special features - The special features of the refuge include the Yukon River and its tributaries, the Yukon Flats, the White Mountains, highly productive lynx habitat in the Black River drainage, and 15 national resource species (both wildlife and fish). The limited scope and short-term nature of oil and gas exploration activities under this alternative would not result in any adverse impacts to the special features of the refuge.

Drilling of exploratory wells, development of production fields, and construction of the main production pipeline would have impacts on several of the refuge's special features. The large number of people involved in these activities would participate in recreational activities on the refuge, thus adding to increasing recreational use on the refuge (projected to increase by 100 percent, to 2,000 visitor use days annually). Although this increase

would not be significant in terms of total public use on the refuge, increasing recreational hunting and fishing activities on the refuge could have a minor impact on populations of those national resource species which are game species, primarily waterfowl. Location and development of production fields and the main production pipeline would result in a number of potential impacts to special features - impacts to water quality and quantity potentially affecting fisheries and waterfowl production, displacement of wildlife including national resource species, possible displacement of lynx from up to 8,000 acres of habitat in the Black River region (where one production field is located), and loss of several hundred acres of wetlands habitat in the Yukon Flats (where the other production field is located) with potential displacement of waterfowl from an area of up to 8,000 acres. Facilities would occupy 500 acres of habitat at each production field and 320 acres along the pipeline resulting in a direct loss of habitat. Up to 8,000 acres would be affected by construction and production activities and over 50,000 acres would be indirectly affected (impacts associated with noise, sight, water and air quality, and increased human use) around the production fields, while over 100,000 acres would be indirectly affected along the pipeline right-of-way.

Mining activities would increase under this alternative. Some direct loss of habitat and displacement of wildlife would occur within the mining site and immediate vicinity (less than 100 acres), although this would have negligible impacts on most national resource species. If coho or chinook salmon use Chandalar Creek (all potential mining sites are in the Chandalar Creek drainage), potential impacts could result from a decrease in water quantity (an average of 1.1 cubic feet per second is required when mining is occurring, depending on the mining method being used) or changes in water quality (potential exists for increased sedimentation of streams if waters are returned without adequate treatment). Any resulting impacts should be negligible.

Commercial timber harvest activities and prescribed burning would result in little loss of habitat and any impacts to water quality would be negligible. Special features of the refuge would not be affected by these activities.

Conclusion: Effects on wilderness values. The management actions in Alternative B could adversely affect the wilderness values of all refuge lands as pointed out in the preceding analysis. Naturalness, solitude, and opportunities for primitive recreation would all be affected. Oil and gas exploration activities would result in some temporary impacts to vegetation (e.g., crushing along 360 to 480 miles of seismic lines - no more than 1,000 acres - and around core drilling sites - less than one acre per site), temporary displacement of sensitive wildlife during the period of activity, and visual impacts resulting from the presence of work crews of 50 or fewer people and from the vegetation impacts, thus affecting the naturalness of areas immediately adjacent to seismic lines and core drilling sites which could be located throughout the refuge, but would have only negligible impacts to other wilderness values. Oil and gas development and increased mining activities would have impacts to all wilderness values (resulting from increased human use, increased noise, increased air traffic, potential impacts to water quality and quantity, displacement of wildlife, surface disturbance, and the construction of facilities), although these impacts would generally be restricted to project sites and the area immediately surrounding the sites (50,000 acres around production fields; 100,000 acres along the main production pipeline; 8,000 acres around the mining site). Timber harvest and prescribed burning would have negligible impacts on wilderness values.

Recreational use, projected to increase by up to 100 percent, would have some minor impacts to opportunities for solitude and primitive recreation, primarily in the vicinity of oil production fields and along the major waterways of the refuge.

Effects on Prescribed Burning. Under the prescribed burning scenario for this alternative, four sites have been proposed for burning (additional burn sites could be proposed in the future). All the proposed sites are in the Flats Wilderness Review Unit. Each burn would cover 10,000 to 20,000 acres. No other habitat improvement techniques would be used on the refuge. The lack of a wilderness proposal under this alternative would not effect prescribed burning on the refuge.

Effects on Commercial Timber Harvest. Commercial timber harvest would be permitted in areas of the refuge under intensive and moderate management under this alternative. As described in the scenario for this alternative, only 20 acres of timber would be harvested from refuge lands annually (along the Yukon River between Fort Yukon and Circle City). The lack of a wilderness proposal under this alternative would not effect commercial timber harvest on the refuge.

Effects on Mining Activities. Not designating any refuge lands as wilderness would have no effect on hardrock mining activities on the refuge. Under Section 304(c) of ANILCA all public lands ". . . in each National Wildlife Refuge . . . are hereby withdrawn, subject to valid existing rights, . . . from all forms of appropriation or disposal under the public land laws, including location, entry and patent under the mining laws . . ." The lack of a wilderness proposal under this alternative would not effect mining activities on the refuge.

Effects on Oil and Gas Activities. Oil and gas exploration activities, including seismic, may occur on refuge lands under all management categories. However, seismic exploration, core drilling, and other oil and gas studies involving the use of motorized equipment would not be permitted in designated wilderness unless conducted by (or for) an agency of the Department of the Interior pursuant to Section 1010 of ANILCA. With no proposed wilderness areas in this alternative, oil and gas exploration activities would not be affected. Oil and gas leasing and development would be permitted on 68 percent of the refuge under this alternative. Only on areas of the refuge under minimal management (32 percent of the refuge) would leasing and development not be permitted at this time. However, this area of the refuge could be open to leasing in the future through revision of the plan if leasing is in the national interest and is determined to be compatible with refuge purposes. Leasing would only be precluded if areas of the refuge were designated as wilderness. This alternative proposes no area for wilderness designation.

ALTERNATIVE C

Alternative C, as described in the Management Alternatives chapter, emphasizes the protection of fish and wildlife populations and habitats in their present state on the refuge, but would provide for a limited amount of development activity to occur on the refuge. No wilderness would be proposed.

Scenarios

The scenarios developed for Alternative C depict projected future levels of prescribed burning on the refuge and levels of oil and gas exploration and development, mining, and commercial timber harvest on the refuge. These scenarios are hypothetical depictions of what might occur in the future and are used only for purposes of analysis and comparison of impacts with the other alternatives.

Prescribed Burning. A number of techniques are available for terrestrial habitat improvement and could potentially occur on the Yukon Flats Refuge under the various management categories. Under Alternative C, habitat improvement techniques, such as mechanical manipulation and water impoundments and diversions, could be used in areas of the refuge under moderate management. However, prescribed burning is considered by the refuge to be the only viable technique available to restore and enhance wildlife habitats on the refuge (wildfire - natural or man-caused - will have similar effects on wildlife habitats). Prescribed burning is the only habitat improvement technique proposed by the refuge staff for use on the refuge. No other habitat improvement techniques (mechanical manipulation or water impoundments and diversions) are expected to be implemented on the refuge in the near future. Such techniques are impractical due to the lack of accessibility to most areas of the refuge, the significant logistical requirements necessary to implement these techniques, and the prohibitive costs.

The prescribed burning scenario for Alternative C assumes that the same projects will be undertaken as are identified in the Alternative A scenario with the same assumptions and constraints being applied. Four burn sites have been identified and, depending on the success of these burns in meeting their intended objectives, additional sites may be identified for future burning. See the prescribed burning scenario under Alternative A.

Commercial Timber Harvest. In Alternative C, 26 percent of the refuge would be in moderate management. Local interest has been expressed in the commercial harvest of timber. This interest is primarily in the harvest of timber for local use (firewood, house logs, and lumber for local construction needs). For purposes of this scenario, it is assumed that Fort Yukon would be the only community that would support a commercial operation in the foreseeable future. The other villages use wood primarily for subsistence purposes (i.e., firewood, house logs), have alternative sources of timber on non-refuge lands (e.g., Native lands), and are not willing (or able) to pay for the type of timber available from refuge lands. For Fort Yukon it is assumed that all of the firewood needs would be met from non-refuge lands. Most of the demand for house logs and lumber also would be satisfied from nearby Native lands. The scenario for this operation, including the development assumptions, is the same as described in the Alternative B scenario.

Placer Mining. Only a limited number of mining claims remain on the Yukon Flats Refuge. Of 332 mining claim case files held by the Bureau of Land Management, only four files remain active. All other case files are closed with all claims voided. No claims have been patented on the refuge. The four active cases are all located in the northeastern area of the refuge in the vicinity of Chandalar Creek. This scenario assumes that a placer mining operation for gold recovery will be developed on one of the claims. The scenario for this operation, including the development assumptions, is the same as described in the Alternative B scenario.

Oil and Gas Exploration, Leasing, and Development. In Alternative C, geologic exploration, including surface rock collecting, gravimetric surveying, and geological mapping activities would be permitted on a site-specific basis throughout the refuge. These activities require essentially no surface disturbance. In addition, seismic surveying and subsurface core drilling could be permitted throughout the refuge, with restrictions placed on activities in designated wilderness. Specific seismic survey methods permitted would be determined by the refuge manager based on the specific needs of the study and the resources which may be impacted. Because of the expense involved in field work, seismic studies and core drilling are likely to occur only on lands which would be available for oil and gas development. Leasing and development activities would be permitted on refuge lands under moderate management in Alternative C. The scenario for oil and gas exploration and development, including the assumptions, is the same as described in the Alternative B scenario.

Biological Effects of Alternative C (Life of the Plan - 15 Years)

Vegetation. Over most of the refuge, changes in vegetation would continue to be primarily the result of natural events, such as flooding and wildfire, and as a result of naturally occurring successional changes.

Alternative C has potential for all types of habitat improvement to occur. Some successional changes under this alternative would be human-controlled. Prescribed burning would be allowed throughout the refuge while other forms of habitat improvement could occur on 26 percent of the refuge. Prescribed burning, however, is the most likely form of habitat manipulation on the refuge and is the only technique proposed in the scenario (10,000 to 20,000 acres burnt on a biannual basis with four burn areas currently identified). Commercial timber harvest would also be permitted under this alternative (no more than 20 acres harvested per year, although permitted on 26 percent of the refuge). Construction of the main production pipeline from the oil fields would result in clearing of some 320 acres (along a 20-foot right-of-way, approximately 160 miles on refuge lands). A set back in plant succession would result from these activities, although the acreage involved would be negligible. Herbaceous and shrubby plants invading an area after disturbance offer abundant forage to species such as moose and many rodents. The effects of this human-caused disturbance on succession would be off-set, in part, by the increased fire control activities necessary to protect new developments in the area of the refuge under moderate management.

In addition to the temporary impacts on vegetation caused by reversals of succession, some fairly permanent impacts would be expected in localized areas of the refuge. Oil and gas leasing and associated development activities may be allowed, if compatible, on 26 percent of the refuge. Construction, gravel

fills, and oil spills which may result essentially remove land from primary plant productivity in localized areas (500 to 1,000 acres of direct loss would result from development of each oil production field in the scenario). Mining activities, as described in the scenario, would result in the disturbance of less than 10 acres per year, a negligible and very localized impact.

Seismic activities would be permitted throughout the refuge. Seismic activities, however, would have negligible impacts to vegetation if air-transported seismic equipment is used and seismic lines are not clearcut. Some crushing of vegetation would result from overland transportation of seismic equipment (geophones and cable).

Wildlife. General Wildlife Impacts--Alternative C could have major effects on wildlife habitats and populations. The extent of impacts would depend on the success of seismic activities and subsequent oil and gas leasing and the amount of other economic activities (including mining and timber harvest) and public use which may occur on the refuge. Assuming a significant find of oil and gas (as in the scenario), diversity of habitats and populations would decrease since a greater proportion of the wetlands habitat would be open to oil and gas development than upland and mountainous habitats. Total populations of wildlife would also be affected with wetland-associated wildlife bearing the brunt of the negative impacts since the wetlands area would be most altered.

Waterfowl--Prescribed burning would be allowed throughout the refuge. The same prescribed burning scenario is used for this alternative as was used in Alternative A - four burns scheduled biannually, each covering 10,000 to 20,000 acres. If burn objectives are being met, additional burn areas could be identified with the burning program extended beyond the initial four burns. As in Alternatives A and B, waterfowl would be affected differently depending on the location and design of the burns. In areas of the refuge where lakes and ponds are low in nutrients, prescribed fire could result in the release of nutrients into lakes and ponds thus improving the waterfowl habitat characteristics of these water bodies. In areas where waterfowl production is currently high, prescribed burning could result in localized minor impacts to waterfowl through the loss of nesting habitat and increased siltation. Overall impacts would be negligible. Other forms of habitat improvement (such as mechanical manipulation and water impoundments and diversions) could occur on 26 percent of the refuge under this alternative, but no habitat improvement projects using these techniques would be undertaken.

Waterfowl populations and the wetland habitats they use could be significantly affected in this alternative should economic quantities of oil and gas be identified and should oil and gas production occur. Some 30 to 40 percent of the wetland habitats on the refuge are within the area where leasing may be allowed. Exploration activities would be allowed throughout the refuge.

Since the oil and gas scenario for this alternative is the same as the scenario used in Alternative B, the potential impacts to waterfowl populations and habitats described in Alternative B would apply to this discussion as well. The only significant difference between the two alternatives is the area of the refuge open to oil and gas leasing - 26 percent of the refuge under Alternative C as opposed to 68 percent of the refuge in Alternative B. Impacts of oil and gas development vary with the activity phase. Most exploration activities would have negligible impacts on waterfowl, including seismic activities if carried out using air-transported equipment and

completed during the winter as outlined in the scenario. Construction and production phases of oil field development, including exploratory drilling, would have both direct and indirect impacts on waterfowl. There would be direct loss of habitat (500 to 1,000 acres for each production field) in addition to impacts related to disturbance of habitats (e.g., noise, dust, changes in water quality and quantity) which could affect significantly larger areas (up to 50,000 acres per production field; over 100,000 acres along the production pipeline).

In Alternative C commercial timber harvest could occur on 26 percent of the refuge (moderate management). Commercial timber harvest, if it occurs as described, would have impacts similar to the impacts associated with oil and gas development. Loss of habitat could occur on a small area (not more than 20 acres), water quality could be degraded, and other impacts related to disturbance could occur although impacts to waterfowl would be primarily associated with transportation of the logs on the Yukon River from the logging site to Fort Yukon. These impacts would be only negligible as this activity would be limited primarily to the main channel of the river and would occur as soon after break up as feasible.

The mining scenario for Alternative C is the same as in Alternative B. Impacts would be the same as those described in Alternative. Some direct loss of habitat would occur (less than 10 acres per year), indirect impacts (primarily noise related) would occur over a small area surrounding the mining site (no more than 8,000 acres), and a slight increase in harvest levels could occur. These impacts would be localized and negligible.

Moose--Alternative C would have mixed impacts on moose. Prescribed burning, as outlined in the scenario for this alternative, would be undertaken primarily for the purpose of improving moose habitat (and, hopefully, the refuge's moose population) through the set back in plant succession on these sites. Similar benefit would result should other forms of habitat improvement be used in the future. Negligible benefits would also result from the disturbance of vegetation due to seismic activities (360 to 480 miles of seismic lines are expected), clearing of the main production pipeline right-of-way (320 acres), and from commercial timber harvest (no more than 20 acres per year), although such benefits would be localized and negligible.

Increased human activity (an increase in recreational use of up to 50 percent, or 500 visitor use days is projected, primarily associated with people involved with economic activities on the refuge and increasing subsistence use associated with growth in the regional population) would have negative impacts on moose, primarily the result of potentially higher moose harvest levels. Some direct loss of habitat would result from oil and gas development (500 to 1,000 acres at each production), mining (less than 10 acres), and other activities allowed on the refuge under this alternative. These impacts would be the same as identified in Alternative B.

Caribou--Scenarios for oil and gas development, prescribed burning, commercial timber harvest, and mining activities are the same for this alternative as in Alternative B. Impacts would generally be the same as in Alternative B, although the extent of potential impacts would be reduced as only 26 percent of the refuge would be under moderate management. Although most of the refuge lies within the range of both the Forty Mile and Porcupine herds, neither herd includes the area as part of their center of habitation (Skoog 1968). With economic activities projected to be at the same level as in Alternative B, a potential for harvest levels to increase would exist as recreational use is projected to increase by up to 50 percent (500 visitor use

days) under this alternative. Direct habitat losses would occur as a result of oil and gas development (500 acres of direct habitat loss at each production field), mining (less than 10 acres), and commercial timber harvest (20 acres). Indirect habitat impacts would also occur (50,000 acres or more of indirect habitat impacts around each production field) as caribou, particularly cows and cows with new calves, are especially intolerant of disturbances such as noise and visual intrusions (Cameron 1983).

Bear--Some increase in bear/human conflicts would be likely under Alternative C. The scenarios for oil and gas development, commercial timber harvest, and mining are the same as in Alternative B. With similar activities and use levels projected to increase only up to 50 percent (500 visitor use days), impacts would generally be the same as (or slightly less than) those discussed under Alternative B, although less of the refuge would be open for potential development.

Furbearers--Impacts would be similar to those discussed in Alternative B, although the potential for impacts to occur would be reduced as less area is open for potential development. Some direct habitat loss would result from oil and gas development (500 to 1,000 acres at each production field) and mining (10 acres). Greater habitat diversity (more edges), the result of prescribed burning, clearing along the main production pipeline right-of-way, and timber harvest, could support higher densities of prey species. Overall, impacts would be localized and negligible.

Peregrine falcon--Peregrine falcon nest sites are present within the moderate management zone in Alternative C. Activities, such as oil and gas development, which continue to be permitted under Alternative C may disturb the birds unless special management actions are taken as prescribed in the Peregrine Falcon Recovery Plan (USDI-FWS 1982b). See Wildlife Management discussion in the common management section of the Management Alternatives Chapter for a discussion of measures to limit impacts to peregrine falcon.

Fisheries. This alternative could potentially result in significant impacts to the fisheries resource. Impacts to the refuge fishery resources could be caused both by increased human use (an increase in recreational use of up to 50 percent, or 500 visitor use days, is projected, primarily associated with those employed in economic activities) and by direct impact on water resources and fish habitats resulting from activities occurring on the refuge. Use of easily accessible fishing areas may result in moderate impacts to population levels. Oil and gas exploration, leasing, and development, mining activities, commercial timber harvest, and prescribed burning would be the same as projected for Alternative B. Therefore, the discussion of impacts under Alternative B is applicable to this alternative as well. Under Alternative C, only 26 percent of the refuge would be open to potential oil and gas leasing and commercial timber harvest, thus confining the area in which impacts could occur (but not necessarily the magnitude of impacts). Some activities, such as agricultural development, are allowed only under intensive management. These activities would not be allowed in Alternative C.

Water Quality and Quantity. Under this alternative seismic activities and prescribed burning may be allowed throughout the refuge, while oil and gas leasing, commercial timber harvest, and other habitat improvement techniques (such as mechanical manipulation and water impoundments and diversions) may be allowed on 26 percent of the refuge. These activities, which have all been discussed under previous alternatives, would be the primary activities

affecting water quality on the refuge in Alternative C. The same scenarios are used in this alternative as were used in Alternative B. Therefore, the same impacts as discussed previously would apply under this alternative, although potential impacts from oil and gas development and timber harvest would be confined to a smaller area of the refuge (although the magnitude would not necessarily change). Significant changes in recreational use levels would not occur, although an increase of up to 50 percent (500 visitor use days), primarily associated with the transient and permanent population growth resulting from oil and gas activities, is projected. Depending on the extent and duration of this population growth, water quality and quantity could be affected on a local basis.

In summary, Alternative C could result in major long-term effects on refuge water quality and quantity in localized areas of the refuge. Many of these potential impacts, however, can be minimized by avoiding waterbodies whenever and wherever possible, by implementing site-specific mitigation measures as described in the scenarios, and by increasing water quality monitoring in areas near all developments. Overall water quality on the refuge, therefore, would experience only minor, long-term impacts with proper control over use.

Visual and Air Quality. The major activities which would affect visual and air quality under Alternative C would be oil and gas leasing and commercial timber harvest, permitted on 26 percent of the refuge. As the scenarios are the same, impacts resulting from these activities would be the same as those discussed under Alternative B, although impacts would be confined to a smaller area of the refuge (magnitude of impacts would not necessarily change). Prescribed burning activities could result in short-term impacts to air quality, although if carried out as prescribed in the burning plan both air quality and visual impacts would be negligible. Other forms of habitat improvement could occur on 26 percent of the refuge, although no plans to use techniques other than prescribed burning have been formulated. Seismic activities would have only negligible impacts to visual and air quality. Long-term visual and air quality impacts, generally negligible, would result from oil and gas production field and pipeline development and from mining and commercial timber harvest.

Overall, implementation of Alternative C would result in moderate impacts on visual and air quality in those areas of the refuge where development would be occurring.

Socioeconomic Effects of Alternative C (Life of the Plan - 15 Years)

Population. Oil and gas exploration, leasing, and development would be the primary activities permitted in Alternative C which could potentially affect populations in refuge communities. Impacts from these activities would be similar to those discussed in Alternative B. Recreational use of the refuge would be projected to increase up to 50 percent, or 500 visitor use days. This increase would not be significant when considering total public use of the refuge. Commercial timber harvesting would be allowed, but the work force would be primarily local residents.

Overall, Alternative C could potentially result in significant increases in both transient and permanent populations of the refuge, either in villages on or near the refuge or in newly created "communities."

Social Conditions. The primary activities affecting social conditions on the refuge under Alternative C would be potential oil and gas exploration, leasing, and development activities. The work force needed to undertake these activities would consist primarily of non-locals. A higher level of local/non-local interaction than currently exists would result. Impacts would be similar to those described in Alternative B, although recreational use would not be encouraged (projected increase of up to 50 percent, or 500 visitor use days) and public facilities would not be provided. The traditional lifestyle of local residents could be altered significantly with greater numbers of people using the limited resources of the refuge and economic activities altering habitats and changing the local economy. Mining and commercial timber harvest activities would employ local residents.

Economy. Under this alternative, oil and gas exploration, leasing, and development may occur, thus effecting the economy of local communities. A seasonal work force would be necessary to carry out seismic activities, although most jobs would be filled by non-locals. Oil and gas leasing and associated development, if they should occur, would create a number of opportunities for local employment, including seasonal, short-term, and permanent jobs. Service-related businesses would benefit as indicated under Alternative B. Oil development would also generate revenues from leasing and royalties from production which would benefit federal, state, and local entities. Mining and commercial timber harvest activities, as described in the scenarios for this alternative, would provide a limited number of seasonal jobs for local residents.

Recreation. The influx of seasonal and permanent workers associated with oil and gas exploration, leasing, and development (as outlined in the scenario) could result in some increase in recreational use (an increase of up to 50 percent, or 500 visitor use days is projected), causing greater pressure to be placed on limited refuge resources. However, subsistence use on the refuge would remain the most significant factor in public use, accounting for more than 90 percent of the public use occurring on the refuge. The permanent work force associated with oil and gas activities would result in a steady rate of growth over the next 10 to 15 years, higher than in Alternative A, but still relatively slow and not a significant factor in overall use. Hunting and fishing activities on the refuge would have the same impacts as discussed under Alternative B.

Cultural Resources. Oil and gas exploration, leasing, and development, commercial timber harvest, mining, and other uses which may occur under this alternative could potentially cause major damage to cultural resources sites on the refuge. Many of these activities would result in the excavation or disturbance of soil surfaces and could potentially cause damage to unidentified cultural resource sites. Whenever and wherever possible, the Service would avoid or minimize impacts to cultural resources through site-specific inventories and evaluations and by use of mitigation or preservation measures.

Although public use is not expected to increase significantly over the next 10 to 15 years (an increase of up to 500 visitor use days, 50 percent above current levels), recreational use on the refuge could cause localized minor impacts to cultural resources.

Overall, impacts to cultural resources would be minor under Alternative C provided site-specific inventories and evaluations are carried out and mitigation or preservation measures are used when necessary.

Subsistence/Section 810(a) Evaluation and Finding. The following section examines the impacts on subsistence that would result from implementation of Alternative C. It conforms to the guidelines recommended by the Alaska Land Use Council for complying with Section 810 of ANILCA.

Opportunities to participate in subsistence activities would not change significantly under Alternative C, but impacts on and competition for subsistence resources would increase. In this alternative, 26 percent of the refuge would be in the moderate management category. Oil and gas leasing and development and commercial timber harvest may occur in this area, which is used extensively for subsistence activities, with impacts similar to those discussed in Alternative B.

Oil and gas exploration, leasing, and development would have the most significant effect on subsistence use of any potential activity under this alternative. If oil development occurs at the level described in the scenario there would be an increase in the number of people using the refuge and its resources (exploratory drilling would require 180 workers for two seasons; 150 to 300 workers would be involved with development of the production fields; construction of the production pipeline would require another 250 workers for two years). Since most of the refuge is used by local residents for subsistence activities, use of the refuge and its resources by a portion of this work force would have a significant impact on subsistence use of the refuge, particularly through increased competition for refuge resources. Even if only a negligible increase in use occurs, the presence of these additional people on the refuge would intensify the concerns of local residents about overuse of the resources and interference with their subsistence activities. Potentially improved access, more people, increased potential for crowding and trespass, and additional pressure on the resources could increase the perception of local residents that their subsistence way of life is being threatened.

Impacts to resources and habitats associated with subsistence use would be most evident in localized areas where specific activities were underway. Development of oil and gas resources, and to a lesser degree, prescribed burning and commercial timber harvest, could result in long-term impacts to subsistence activities. Timing of construction activities and stipulations placed on special use permits would limit the extent of adverse impacts, but displacement of wildlife and disturbance or loss of habitats would still have minor impacts on resources taken by subsistence users. Hunters and trappers from Beaver, Birch Creek, Fort Yukon, and Chalkyitsik would be most affected. Subsistence fishing could also be affected, through impacts to water quality and fisheries habitats resulting from oil and gas development.

In association with the oil and gas development, some improvement in access would occur. Unimproved roads and limited maintenance temporary roads providing access to oil and gas development sites would be permitted. These roads, however, would provide only limited additional access for users of subsistence resources. Potential impacts over the long term would be minor.

Expenditures in support of oil and gas activities could provide minor economic benefits to Fort Yukon and other local communities. Oil and gas exploration and development on the refuge would also create a small number of new jobs for local residents. These benefits, though, would have only a minor impact because of their generally short duration. Alternative C would have little effect on future subsistence needs of local residents. The subsistence lifestyle would continue to be extremely important to most residents.

Although the impacts of this alternative are similar to those discussed under Alternative B, the primary economic factor - oil and gas development and production - would be restricted to only 26 percent of the refuge, although the magnitude of the development could be the same as in Alternative B.

Availability of Other Lands - Section 810(a) requires that the availability of other lands be considered in evaluating the effect of refuge management alternatives on subsistence uses. This plan is a refuge plan by definition and addresses the general suitability of a broad range of activities for refuge lands. Thus, though other lands may be available for the uses considered, lands outside of the refuge are not considered because they are beyond the scope of this plan.

Other Alternatives - Consideration of other alternatives is also required by Section 810(a). Five management alternatives have been analyzed for the Yukon Flats Refuge. Alternative C may open about one fourth of the refuge to oil and gas leasing and development, resulting in localized, long-term impacts to resources taken by subsistence users. Although opportunities to participate in subsistence activities would not be affected, the presence of oil and gas workers on the refuge would intensify the concerns of local residents about overuse of the resources and interference with their subsistence lifestyle.

Alternative A, the Current Situation, has few impacts on the subsistence way of life. All refuge lands would be classified as minimal management. Alternative D, the Service's preferred alternative, and Alternative E are similar to Alternative A in that all refuge lands would be classified as minimal management. They differ from Alternative A in that lands would be proposed for designation as wilderness (eight percent in Alternative D; all refuge lands in Alternative E). Under these alternatives, opportunities to participate in subsistence activities would be maintained. Implementation would have negligible effects on the subsistence way of life, although the presence of seismic crews could intensify the concerns of local residents about overuse of resources and interference with their subsistence lifestyle.

Alternative B would allow oil and gas development and commercial timber harvest on 68 percent of the refuge. Other economic uses and public facilities would be permitted on 22 percent of the refuge. Although opportunities to participate in the subsistence lifestyle would not be significantly altered, improved access, increased recreational use, and more economic development would result in long-term impacts to subsistence resources and activities and increased concern by local residents that their subsistence lifestyle would be threatened.

Other alternatives were considered during early stages in the planning process. Many of these alternatives fell within the range of alternatives which are evaluated in this document and would result in variations of the impacts discussed previously. Other alternatives opened more of the refuge to development of public facilities and economic uses. These alternatives were determined not to meet refuge purposes as outlined in ANILCA and were, therefore, not evaluated further in this document.

Finding - Implementation of Alternative C could result in significant impacts to refuge resources and increasing competition for the limited resources available on the refuge, thus potentially resulting in a significant restriction of subsistence use on the refuge.

Wilderness Designation Effects of Alternative C (50 Years)

In Alternative C, no lands on the Yukon Flats Refuge would be proposed for wilderness designation. The refuge would be managed under two management categories - 26 percent under moderate management and 74 percent under minimal management. Areas of the refuge could be developed for economic uses that might not protect wilderness values, but would be compatible with refuge purposes.

Impacts on Area not Proposed for Wilderness

Effects on Wilderness Values. The following section describes the effects of not designating any of the Yukon Flats Refuge as wilderness.

Naturalness - Activities which would be allowed on the refuge under Alternative C and which could affect naturalness in the short and long term include oil and gas exploration, leasing, and development, placer mining, commercial timber harvest, and prescribed burning. Core drilling and seismic exploration, although allowed throughout the refuge, would most likely occur in the area of the refuge where leasing could occur (26 percent of the refuge under moderate management). These activities would occur during the winter. Crushing of vegetation would occur along the 360 to 480 miles of seismic lines (within a 20 foot right-of-way, less than 1,000 acres) and in a small area at each core drilling site (less than one acre per site). Sensitive wildlife, primarily wolves and wolverines, would be temporarily displaced from the areas where seismic activities and core drilling would occur. Most other species sensitive to disturbance (e.g., swans, bald eagles, peregrine falcon, ospreys, and grizzly bears) would not be present during the winter months. Visual impacts would also be evident as people (50 or less) and equipment would be present in the project areas and impacts to vegetation would be evident. Because of the short duration during the winter when these activities would occur and the small area involved, any impacts to the naturalness of the refuge would be short-term and negligible.

Oil and gas leasing and development could also occur under this alternative (on up to 26 percent of the refuge). It is projected that three exploratory wells would be drilled and two producing oil fields would be developed (see oil and gas scenario). A large number of people would be involved in these activities and numerous facilities would be constructed. For each production field, an airstrip and staging area, central production facility, housing, up to six drill pads, and associated pipelines and roads would be required. As many as 300 people would be involved with drilling and production of oil from each field, while smaller temporary crews would be involved with pipeline construction and drilling of exploratory wells. Development of the production fields and construction of main production pipeline would adversely affect the naturalness of the project area and its surroundings - over 50,000 acres at and surrounding each of the production fields and over 100,000 acres along the pipeline. Direct loss of habitat would occur at the same level as described under Alternative B. Other impacts to the naturalness of the area (including noise generation, increased air traffic, changes in water quality and quantity, displacement of wildlife, and visual impacts) would also be as described under Alternative B, affecting over 50,000 acres around each production field and over 100,000 acres along the pipeline.

Placer mining activities on the refuge are expected to increase in the future (see mining scenario). The mining activity itself would involve less

than 10 acres of land per year (for excavation of mineral bearing gravels and for storage of overburden). Mining activities would utilize significant quantities of water (1.1 cubic feet per second) from adjacent streams (settling ponds would be constructed and water recycled to the maximum extent possible). Support facilities (such as a bunkhouse/cookhouse, workshop, storage facility for equipment, unimproved roads) would be required. Surface disturbance would occur and facilities and people (during the summer mining season, approximately four months) would be present on the mining site and its immediate surroundings (an area of less than 100 acres, including already mined areas) within the Sheenjek/Porcupine Unit. With activities predicted to be at the same level as in Alternative B, the extent of any impacts would be the same as described in Alternative B - direct impacts (including surface disturbance and impacts related directly to the presence of facilities and people) would be confined to an area of less than 100 acres. Other impacts to the naturalness of the area (including noise generation, water quality and quantity changes, and displacement of wildlife) would also be as described under Alternative B, affecting an area of up to 8,000 acres surrounding the mining site.

Commercial timber harvest activities would be permitted on up to 26 percent of the refuge under this alternative. However, timber harvest is anticipated to occur on only 20 acres annually (see commercial timber harvest scenario). This acreage would be located along the Yukon River between Fort Yukon and Circle City in the Flats Unit. Removal of timber from up to 20 acres (in one acre clearcut blocks or strips), addition of temporary structures to the landscape, the noise from motorized equipment, and the temporary displacement of sensitive wildlife (such as wolves, wolverines, and waterfowl) would adversely affect the naturalness of the area. Such impacts would be most evident at the time of harvest (winter) and during the time when trees are removed from the harvest site (after spring break up). An area of 100 acres would be most directly affected, however a larger area - up to a two mile radius (8,000 acres) around the harvest area - may be indirectly affected.

Prescribed burning projects (four burns of 10,000 to 20,000 acres each, to be burnt on a biannual basis) would have little effect on the naturalness of the refuge. Burn sites would appear generally the same as if a wildfire had burnt the site. Wildfire is considered a natural part of refuge ecosystems.

Outstanding opportunities for solitude - Recreational use of the refuge is not expected to grow significantly (up to 50 percent for a total of 1,500 visitor use days annually). However, much of this use would be by people involved in oil and gas exploration and development and would be concentrated in the area surrounding the production fields. A small number of people (50 for core drilling, less for seismic activities and mapping) would be involved in oil and gas exploration activities on the refuge. With these activities occurring primarily during the winter, opportunities for solitude for the wilderness user on the refuge would not be affected as a result of oil and gas exploration activities.

Oil and gas development, including drilling of exploratory wells, construction of production facilities for two oil fields (500 to 1,000 acres directly affected at each field), and construction of the main production pipeline (320 acres directly affected), would result in impacts to opportunities for solitude. The number of people necessary to complete exploratory drilling (180 people over two winter seasons), production field development (150 to 300 people during construction and production phases), and main production pipeline construction (250 people for two years) coupled with increased noise from equipment and motorized vehicles on-site and from

aircraft traveling to and from the sites would have a significant impact on opportunities for solitude, particularly in an area surrounding the project sites - for a radius of up to five miles (50,000 acres around the production fields and for a distance extending one half mile either side of the main production pipeline - over 100,000 acres - during pipeline construction).

Mining activities and commercial timber harvest would occur at levels higher than at the present time. However, the limited extent of both mining and timber harvest (considering noise and sight impacts less than 8,000 acres would be adversely effected by either activity), the seasonal nature of the activities (summer for mining, winter for timber harvest), and the low number of people involved (no more than three for mining, four for timber harvest) would result in only a small degree of disruption to opportunities for solitude on the refuge.

Recreational use is anticipated to increase by as much as 50 percent above current levels. However, contact between refuge users would remain low and opportunities for solitude would not be diminished. Users during hunting season may occasionally encounter other parties, although hunting restrictions would still limit the number of licenses issued in a large area of the refuge (see Figure 14). Except for limited contact along major river systems outstanding opportunities for solitude would be available throughout much of the refuge.

Outstanding opportunities for primitive recreation - Oil and gas exploration activities (geologic mapping, 360 to 480 miles of seismic lines, core drilling) would occur primarily during the winter, require low numbers of people to accomplish (50 or less), and would be limited in duration and extent. Opportunities for primitive recreation would not be affected.

Oil and gas development, including exploration wells, production facilities, and the main production pipeline, would reduce opportunities for primitive recreation in the immediate project area (500 to 1,000 acres per production field, 320 acres in the pipeline right-of-way) through the direct impacts of people and facilities. The primitive recreation experience would be affected in an area extending up to five miles outward from the project site (50,000 acres) due to noise from equipment and motorized vehicles, increased air traffic, and reduced hunting and trapping opportunities as wildlife is displaced from the project area. Similar impacts would occur along a strip extending one half mile either side of the pipeline right-of-way (over 100,000 acres), primarily during pipeline construction although some impacts would still occur after the pipeline is operational. Some workers associated with oil and gas development would also recreate on the refuge, particularly in the vicinity of their work. This increase, coupled with other growth in recreational use, would result in a projected increase of 50 percent in recreational use (an increase of approximately 500 visitor use days annually). This growth in recreational use would result in a slight decrease in opportunities for primitive recreation, with most of the impact concentrated in the area surrounding the production fields (within a five mile radius, an area of some 50,000 acres) and along the major waterways of the refuge.

Mining activities, such as the removal of overburden, construction of settling ponds, dredging operations, and facility construction, would eliminate opportunities for primitive recreation within the mining site (less than 100 acres) during the mining season (four months during the summer). The primitive recreation experience would be adversely affected in an area extending up to two miles outward from the project site (8,000 acres), due

primarily to noise from equipment and motorized vehicles involved in the mining operation.

Special features - The special features of the refuge include the Yukon River and its tributaries, the Yukon Flats, the White Mountains, highly productive lynx habitat in the Black River drainage, and 15 national resource species (both wildlife and fish). The limited scope and short-term nature of oil and gas exploration activities under this alternative would not result in any adverse impacts to the special features of the refuge.

Drilling of exploratory wells, development of production fields, and construction of the main production pipeline would have impacts on several of the refuge's special features. The large number of people involved in these activities would participate in recreational activities on the refuge, thus adding to increasing recreational use on the refuge (projected to increase by 50 percent, to 1,500 visitor use days annually). Although this increase would not be significant in terms of total public use on the refuge, increasing recreational hunting and fishing activities on the refuge could have a minor impact on populations of those national resource species which are game species, primarily waterfowl. Location and development of production fields and the main production pipeline would result in a number of potential impacts to special features - the same impacts as described under the special features discussion in Alternative B. Facilities would occupy 500 acres of habitat at each production field and 320 acres along the pipeline resulting in a direct loss of habitat. Up to 8,000 acres would be affected by construction and production activities and over 50,000 acres would be indirectly affected (impacts associated with noise, sight, water and air quality, and increased human use) around the production fields, while over 100,000 acres would be affected along the pipeline right-of-way.

Mining activities would increase under this alternative. Some direct loss of habitat and displacement of wildlife would occur within the mining site and immediate vicinity (less than 100 acres), although this would have negligible impacts on most of the national resource species. If coho or chinook salmon use Chandalar Creek (all potential mining sites are in the Chandalar Creek drainage), potential impacts could result from a decrease in water quantity (an average of 1.1 cubic feet per second is required when mining is occurring) or changes in water quality (potential exists for increased sedimentation of streams if waters are returned without adequate treatment). Any resulting impacts should be negligible.

Commercial timber harvest activities and prescribed burning would result in little loss of habitat and any impacts to water quality would be negligible. Special features of the refuge would not be affected by these activities.

Conclusion: Effects on wilderness values. The management actions in Alternative C could adversely affect the wilderness values of all refuge lands as pointed out in the preceding analysis. Naturalness, solitude, and opportunities for primitive recreation would all be affected. Oil and gas exploration activities would result in some temporary impacts to vegetation (e.g., crushing along 360 to 480 miles of seismic lines - no more than 1,000 acres - and around core drilling sites - less than one acre per site), temporary displacement of sensitive wildlife during the period of activity, and visual impacts resulting from the presence of workers and from the vegetation impacts, thus affecting the naturalness of the areas immediately adjacent to seismic lines and core drilling sites which could be located

throughout the refuge, but would have only negligible impacts to other wilderness values. Oil and gas development and increased mining activities would have impacts to naturalness, solitude, and primitive recreation (resulting from increased human use, increased noise, increased air traffic, potential impacts to water quality and quantity, displacement of wildlife, surface disturbance, and the construction of facilities), although these impacts would generally be restricted to project sites and the area immediately surrounding the sites (50,000 acres around production fields; 100,000 acres along the main production pipeline; 8,000 acres around the mining site). Timber harvest and prescribed burning would have negligible impacts on wilderness values. Recreational use, projected to increase by up to 50 percent, would have some minor impacts to opportunities for solitude and primitive recreation, primarily in the vicinity of oil production fields and along the major waterways of the refuge.

Effects on Prescribed Burning. Under the prescribed burning scenario for this alternative, four sites have been proposed for burning (additional burn sites could be proposed in the future). All the proposed sites are in the Flats Wilderness Review Unit. Each burn would cover 10,000 to 20,000 acres. No other habitat improvement techniques would be used on the refuge. The lack of a wilderness proposal under this alternative would not effect prescribed burning on the refuge.

Effects on Commercial Timber Harvest. Commercial timber harvest would be permitted in areas of the refuge under moderate management under Alternative C. As described in the scenario for this alternative, only 20 acres of timber would be harvested from refuge lands annually (along the Yukon River between Fort Yukon and Circle City). The lack of a wilderness proposal under this alternative would not effect commercial timber harvest on the refuge.

Effects on Mining Activities. Not designating any refuge lands as wilderness would have no effect on hardrock mining activities on the refuge. Under Section 304(c) of ANILCA all public lands ". . . in each National Wildlife Refuge . . . are hereby withdrawn, subject to valid existing rights, . . . from all forms of appropriation or disposal under the public land laws, including location, entry and patent under the mining laws . . ." The lack of a wilderness proposal under this alternative would not effect mining activities on the refuge.

Effects on Oil and Gas Activities. Oil and gas exploration activities, including seismic, may occur on refuge lands under all management categories. However, seismic exploration, core drilling, and other oil and gas studies involving the use of motorized equipment would not be permitted in designated wilderness unless conducted by (or for) an agency of the Department of the Interior pursuant to Section 1010 of ANILCA. With no proposed wilderness areas in this alternative, oil and gas exploration activities would not be affected. Oil and gas leasing and development would be permitted on 26 percent of the refuge under this alternative. Only on areas of the refuge under minimal management (74 percent of the refuge) would leasing and development would not be permitted at this time. However, these areas of the refuge could be opened to leasing in the future through revision of the plan if leasing is in the national interest and is determined to be compatible with refuge purposes. Leasing would only be precluded if areas of the refuge were designated as wilderness. This alternative proposes no area for wilderness designation.

ALTERNATIVE D

Alternative D is the Service's preferred alternative. Alternative D would maintain the existing range and intensity of management and recreational and economic uses on the refuge. Eight percent of the refuge, in the White-Crazy Mountains, would be proposed for wilderness designation.

Scenarios

The scenarios developed for Alternative D depict projected future levels of prescribed burning on the refuge and levels of oil and gas exploration and development, mining, and commercial timber harvest on the refuge. These scenarios are hypothetical depictions of what might occur in the future and are used only for purposes of analysis and comparison of impacts with the other alternatives.

Prescribed Burning. A number of techniques are available for terrestrial habitat improvement and could potentially occur on refuge under the various management categories. Prescribed burning is considered by the refuge to be the only viable technique available to restore and enhance wildlife habitats on the refuge (wildfire - natural or man-caused - will have similar effects on wildlife habitats). Prescribed burning is the only habitat improvement technique proposed by the refuge staff for use on the refuge and is the only technique which would be allowed in minimal management or designated wilderness. No other habitat improvement techniques (mechanical manipulation or water impoundments and diversions) are expected to be implemented on the refuge in the near future. Such techniques are impractical due to the lack of accessibility to most areas of the refuge, the significant logistical requirements necessary to implement these techniques, and the prohibitive costs. Under Alternative D, prescribed burning would be the only technique permitted as all refuge lands would be categorized as minimal management.

The prescribed burning scenario for Alternative D assumes that the same projects will be undertaken as are identified in the Alternative A scenario with the same assumptions and constraints being applied. Four burn sites have been identified and, depending on the success of these burns in meeting their intended objectives, additional sites may be identified for future burning. See the prescribed burning scenario under Alternative A.

Commercial Timber Harvest. In Alternative D all refuge lands would be designated as minimal management areas (eight percent of these lands would be proposed for designation as wilderness). Wilderness and minimal management categories both preclude commercial timber harvest activities. For the purposes of analysis it is therefore assumed that commercial timber operations would not occur on the refuge over the next 50 years.

Placer Mining. Only a limited number of mining claims remain on the Yukon Flats Refuge. Of 332 mining claim case files held by the Bureau of Land Management, only four files remain active. All other case files are closed with all claims voided. No claims have been patented on the refuge. The four active cases are all located in the northeastern area of the refuge in the vicinity of Chandalar Creek. This scenario assumes that a placer mining operation for gold recovery will be developed on at least one of the claims. The scenario for this operation, including the development assumption, is the same as described in the Alternative B scenario.

Oil and Gas Exploration, Leasing, and Development. In Alternative D, geologic exploration, including surface rock collecting, gravimetric surveying, and geological mapping activities would be permitted on a site-specific basis throughout the refuge. These activities require essentially no surface disturbance. In addition, seismic surveying and subsurface core drilling could be permitted throughout the refuge, with restrictions placed on activities in designated wilderness. Specific seismic survey methods permitted would be determined by the refuge manager based on the specific needs of the study and the resources which may be impacted. Because of the expense involved in field work, seismic studies and core drilling are likely to occur only on or near lands which would be available for oil and gas development. The scenario for oil and gas exploration and development, including the assumptions, is the same as described in the Alternative A scenario.

Biological Effects of Alternative D (Life of the Plan - 15 Years)

Vegetation. Impacts on vegetation would be similar to those described in Alternative A. Changes in vegetation would primarily be successional changes resulting from natural events (wildfire and flooding), prescribed fire (four burns of 10,000 to 20,000 acres each), mining, and oil and gas exploration activities. Placer mining activities, as described in the scenario, would result in the disturbance of less than 10 acres per year, a negligible and very localized impact.

Wildlife. Impacts under this alternative would be similar to those described in Alternative A. The main difference is that eight percent of the refuge would be recommended for wilderness designation. Wilderness designation of the White-Crazy Mountains would give maximum protection and continuity of management to the upland wildlife resources of this area. Seismic activities may be allowed in designated wilderness, but only if conducted by (or for) an agency of the Department of the Interior in accordance with Section 1010 of ANILCA. Only localized negligible impacts would result from seismic and other geologic exploration activities as in Alternative A. Prescribed burning (four burns of 10,000 to 20,000 acres each to be burnt on a biannual basis) would have mixed impacts on wildlife. Waterfowl species would benefit if burns occur in areas where lakes and ponds are low in nutrients, but in areas where production is currently high loss of nesting and rearing habitat could occur. Moose and other species which utilize early successional habitats as a source of food would benefit from prescribed fire, however, there could be a short-term loss of habitat for other species. Because prescribed burning projects would be limited in scope, impacts from the projects would be localized and generally negligible in extent. Negligible benefits would also result from commercial timber harvest (20 acres annually), although some temporary displacement of wildlife would occur during winter harvest periods. Placer mining activities, as described in the scenario, would result in localized loss of habitat (less than 10 acres per year) and displacement of wildlife from no more than 8,000 acres. Such impacts would be negligible.

Fisheries. Impacts under this alternative would be similar to those in Alternative A. The only significant difference is that eight percent of the refuge would be recommended for designation as wilderness. Seismic exploration may be allowed in designated wilderness, but only if conducted by (or for) an agency of the Department of the Interior in accordance with

Section 1010 of ANILCA. Seismic and other geologic exploration activities would have localized negligible to moderate impacts on fishery resources as described under Alternative A. Mining on the refuge could have impacts similar to those discussed under Alternative A (which were primarily the result of mining on claims outside the refuge boundary). With water quality monitoring, strict enforcement of State Water Quality Standards, and studies to monitor baseline fish populations and to locate spawning and rearing areas of various fish species, only minor impacts would be expected. Proposed prescribed burning would be monitored and impacts, if any, would be minor, primarily associated with possible increases in run-off and sedimentation of streams in the project areas and subsequent impacts on fishery resources.

Water Quality and Quantity. Water quality and quantity would not change appreciably over the long-term under the management direction in Alternative D. As in Alternative A, negligible short-term impacts may occur in localized areas of the refuge. Recreational use would increase (up to 35 percent, or 350 visitor use days) if the eight percent of the refuge recommended for wilderness is designated by Congress. This increase would not be significant over the next 10 to 15 years. Any potential impacts to water quality from this increase would be negligible. Seismic activities may result in minor localized impacts to water quality, although impacts would be negligible if air-transported seismic equipment is used and clearcutting of vegetation in seismic lines is not done. Mining activities, although above current levels, would be limited (less than 10 acres disturbed annually). Impacts resulting from this activity would be localized and negligible provided federal and state guidelines are followed. Prescribed burning would have negligible impacts on water quality unless a burn escapes and it becomes necessary to utilize heavy equipment in constructing firelines or for other suppression activities.

Visual and Air Quality. Management of the refuge under this alternative would not change significantly from the current situation (Alternative A), although eight percent of the refuge would be recommended for wilderness designation. Seismic activities, if carried out using helicopter-transported equipment and without clearcutting seismic lines, would result in negligible short-term visual impacts. Prescribed burning would simulate wildfire thus having only negligible visual impacts. Short-term impacts to air quality would occur, but smoke would be directed away from populated areas. Mining activities, because of their limited nature (less than 10 acres directly impacted annually), would have only localized impacts to both visual and air quality, the result of clearing and excavation activities. Visual and air quality would not change significantly under this alternative.

Socioeconomic Effects of Alternative D (Life of the Plan - 15 Years)

Population. Management under Alternative D would be basically the same as in Alternative A. Alternative D does, however, propose eight percent of the refuge for designation as wilderness. Even with congressional designation of a portion of the refuge as wilderness, recreational use would be projected to increase no more than 35 percent (or 350 visitor use days), only 10 percent higher than projected for Alternative A. Although the accuracy of recreational estimates is generally low and any subsequent analysis of demand must be made

with caution, reported use figures indicate that "recreational use in wilderness has outpaced the overall rate of growth for outdoor recreation in other areas . . . " (USDA-FS 1980). This increase in the transient population, however, would be negligible over the next 10 to 15 years.

Social Conditions. Negligible change in social conditions on the refuge would occur if this alternative were implemented. The traditional lifestyle of local residents would not be altered. Interaction between communities would not be effected significantly. Only a negligible increase in local/non-local interaction would occur, resulting primarily from seasonal workers involved in seismic and other exploration activities (50 or less, primarily during winter) and from a small increase in recreational users (up to 35 percent, or 350 visitor use days) should any of the refuge be designated as wilderness by Congress.

Economy. Alternative D would have only negligible effects on the local economy, similar to the impacts of Alternative A. Most economic uses and facilities would not be permitted on the refuge. Oil and gas exploration may be allowed, requiring a small (50 or less), primarily transient work force which would have limited impact on the local economy. Mining activities could employ no more than three local residents on a seasonal basis. A 35 percent increase in recreational use could occur if any portion of the refuge is designated as wilderness, but this increase would not result in any new jobs and would have little economic benefit to local service-related businesses.

Recreation. Recreational use would increase more than in Alternative A (up to 35 percent, or 350 visitor use days, compared to 25 percent in Alternative A). Recreational use of the refuge would increase at a slightly faster rate than anticipated under Alternative A as a result of Congressional designation of the White-Crazy Mountains area as wilderness. See Population above. This increase, however, would not be a significant factor in total public use of the refuge and would have negligible impacts on refuge resources.

Cultural Resources. As in Alternative A, only a limited number of activities would be permitted. These activities could result in incidental damage to cultural resource sites, generally negligible in nature. Recreational use would not increase significantly over the next 10 to 15 years, although some growth would be anticipated (up to 35 percent, or 350 visitor use days) if the area of the refuge proposed for wilderness is designated by Congress. Potential impacts to cultural resources would be minimized or avoided by completing site-specific inventories and evaluations and through use of mitigation and preservation measures. Any impacts to cultural resources would be negligible.

Subsistence/Section 810(a) Evaluation and Finding. The following section examines the impacts on subsistence that would result from implementation of Alternative D. It conforms to the guidelines recommended by the Alaska Land Use Council for complying with Section 810 of ANILCA.

Alternative D would have basically the same effect on subsistence activities on the refuge as Alternative A. The White-Crazy mountains area of the refuge, proposed for designation as wilderness under this alternative, was not identified as a major subsistence use area. Designation of the area as wilderness, therefore, would have little affect on subsistence activities.

Placer mining, oil and gas exploration, and prescribed burning activities under this alternative, would have only negligible localized impacts on subsistence resources and subsistence activities on the refuge.

Availability of Other Lands - Section 810(a) requires that the availability of other lands be considered in evaluating the effect of refuge management alternatives on subsistence uses. This plan is a refuge plan by definition and addresses the general suitability of a broad range of activities for refuge lands. Thus, though other lands may be available for the uses considered, lands outside of the refuge are not considered because they are beyond the scope of this plan.

Other Alternatives - Consideration of other alternatives is also required by Section 810(a). Five management alternatives have been analyzed for the Yukon Flats Refuge. Alternative D, the Service's preferred alternative, classifies all refuges lands as minimal management, the same as Alternative A, the Current Situation. It differs from Alternative A in that eight percent of the refuge would be proposed for wilderness designation. In addition placer mining activities would increase above current levels. This activity, however, would directly impact less than 10 acres annually, resulting in only localized negligible impacts to subsistence resources. Opportunities to participate in subsistence activities would be maintained.

Alternative A, the Current Situation, has few impacts on the subsistence way of life. All refuge lands would be classified as minimal management. Alternative E is similar to Alternative A with all refuge lands being in minimal management. It differs from Alternative A in that all refuge lands would be recommended for designation as wilderness. Under these alternatives, opportunities to participate in subsistence activities would be maintained and implementation would have negligible effects on the subsistence way of life, although the presence of seismic crews on the refuge may intensify the concerns of local residents about overuse of the resources and interference with their subsistence lifestyle. Placer mining activities would increase (under Alternative E), although less than 10 acres would be impacted annually.

Alternative C may open about one fourth of the refuge to oil and gas development and associated activities, resulting in localized, long-term impacts to resources taken by subsistence users. Although opportunities to participate in subsistence activities would not be affected, the presence of oil and gas workers on the refuge would intensify the concerns of local residents about overuse of the resources and interference with their subsistence lifestyle. Alternative B would allow oil and gas leasing and development and commercial timber harvest on 68 percent of the refuge. Other economic uses and public facilities would be permitted on 22 percent of the refuge. Although opportunities to participate in the subsistence lifestyle would not be significantly altered, improved access, increased recreational use, and more economic development would result in long-term impacts to subsistence resources and activities and increased concern by local residents that their subsistence lifestyle would be threatened.

Other alternatives were considered during early stages in the planning process. Many of these alternatives fell within the range of alternatives which are evaluated in this document and would result in variations of the impacts discussed previously. Other alternatives opened more of the refuge to development of public facilities and economic uses. These alternatives were determined not to meet refuge purposes as outlined in ANILCA and were, therefore, not evaluated further in this document.

Finding - Implementation of Alternative D, the Service's preferred alternative, would not result in any significant restriction of subsistence uses on the refuge.

Wilderness Designation Effects of Alternative D (50 Years)

In Alternative D, the Service would propose that the White-Crazy Mountains, an area encompassing about 650,000 acres of federal land (eight percent of the refuge), be added to the National Wilderness Preservation System. Long-term Congressional protection would be provided to fish and wildlife habitats found in the White-Crazy Mountains.

Impacts on Area not Proposed for Wilderness

Effects on Wilderness Values. The following section describes the effects on that 92 percent of the refuge not proposed for designation as wilderness.

Naturalness - Activities which would be allowed on the refuge and which could affect naturalness in the short and long term include core drilling and seismic exploration, placer mining, and prescribed burning. Core drilling and seismic exploration, although allowed throughout the refuge, would most likely occur in the area of the refuge identified as having moderate potential for oil and gas discovery (about 68 percent of the refuge, see Figure 7). These activities would occur during the winter. Crushing of vegetation would occur along the 360 to 480 miles of seismic lines (within a 20 foot right-of-way, less than 1,000 acres) and in a small area at each core drilling site (less than one acre each). Sensitive wildlife, primarily wolves and wolverines, would be temporarily displaced from the areas where seismic activities and core drilling would occur. Most other species sensitive to disturbance (e.g., swans, bald eagles, peregrine falcon, ospreys, and grizzly bears) would not be present during the winter months. Visual impacts would also be evident as people (50 or less) and equipment would be present in the project areas and crushing of vegetation would occur. Because of the short duration and limited extent of these activities, any impacts to the naturalness of the refuge would be short-term and negligible. In the future, oil and gas leasing could also occur on 92 percent of the refuge if such leasing is determined to be in the national interest and if leasing is determined to be compatible with the refuge purposes, although a revision of the plan would be necessary before leasing could occur. This situation is not projected for this alternative.

Placer mining activities on the refuge are expected to increase in the future (see mining scenario). The mining activity itself would involve less than 10 acres of land per year (for excavation of mineral bearing gravels and for storage of overburden). Mining activities would utilize significant quantities of water (approximately 1.1 cubic feet per second when mining is occurring, depending on the mining method used) from adjacent streams (settling ponds would be constructed and water recycled to the maximum extent possible). Support facilities (such as a bunkhouse/cookhouse, workshop, storage facility for equipment, unimproved roads) would be required. Surface disturbance would occur and facilities and people (during the summer mining season, approximately four months) would be present on the mining site and its immediate surrounding (an area of less than 100 acres, including already mined areas) within the Sheenjek/Porcupine Unit. With activities predicted to be at the same level as

in Alternative B, the extent of any impacts would be the same as described in Alternative B - direct impacts (including surface disturbance and impacts related directly to the presence of facilities and people) would be confined to an area of less than 100 acres. Other impacts to the naturalness of the area (including noise generation, water quality and quantity changes, and displacement of wildlife) would also be as described under Alternative B, affecting an area of up to 8,000 acres surrounding the mining site.

Prescribed burning projects (four burns of 10,000 to 20,000 acres each, to be burnt on a biannual basis) would have little effect on the naturalness of the refuge. Burn sites would appear generally the same as if a wildfire had burnt the site. Wildfire is considered a natural part of refuge ecosystems.

Outstanding opportunities for solitude - Mining activities would occur at levels higher than at the present time. However, the limited extent of mining activities (even considering noise and sight impacts less than 8,000 acres would be adversely affected), the seasonal nature of mining (summer), and the limited number of people involved (no more than three) make any potential impacts to opportunities for solitude negligible.

A small number of people (50 for core drilling, less for seismic activities and mapping) would be involved in oil and gas exploration activities on the refuge. With activities occurring primarily during the winter, opportunities for solitude for the wilderness user on the refuge would not be affected as a result of oil and gas exploration activities.

Recreational use would increase by up to 35 percent. Subsistence use would change only as the regional population grows. Such changes would not be enough to effect opportunities for solitude on the refuge. Users during hunting season may occasionally encounter other parties. However, except for limited contact along major river systems, outstanding opportunities for solitude would still exist.

Outstanding opportunities for primitive recreation - Recreational use would increase by up to 35 percent (to a total of 1,350 visitor use days annually) under this alternative. This change would not significantly affect opportunities for primitive recreation on the refuge because this increase in use, although potentially concentrated along major waterways on the refuge, would be dispersed over a period of four to five months each year. Core drilling and seismic activities would occur primarily during the winter with only a small number of people involved (50 or fewer). These activities would not affect opportunities for primitive recreation on the refuge.

Mining activities, such as the removal of overburden, construction of settling ponds, dredging operations, and facility construction, would eliminate opportunities for primitive recreation within the project site (less than 100 acres) during the mining season (four months during the summer). The primitive recreation experience would be slightly affected in an area extending up to two miles outward from the project site (8,000 acres), due primarily to noise from equipment and motorized vehicles involved in the mining operation.

Special features - The special features of the refuge include the Yukon River and its tributaries, the Yukon Flats, the White Mountains, highly productive lynx habitat in the Black River drainage, and 15 national resource species (both wildlife and fish). The limited scope and short-term nature of oil and gas exploration activities under this alternative would not result in any adverse impacts to the special features of the refuge.

Mining activities would increase under this alternative. Some direct loss of habitat and displacement of wildlife would occur within the mining site and immediate vicinity (less than 100 acres), although this would have negligible impacts on most of the national resource species. If coho or chinook salmon use Chandalar Creek (all potential mining sites are in the Chandalar Creek drainage), potential impacts could result from a decrease in water quantity (an average of 1.1 cubic feet per second of water is required while mining, depending on the mining method being used) or changes in water quality (potential exists for increased sedimentation of streams if waters are returned without adequate treatment). Any resulting impacts should be negligible.

Prescribed burning would result in little loss of habitat on the refuge and any impacts to water quality would be negligible. Special features of the refuge would not be adversely affected.

Conclusion: Effects on wilderness values. The management actions proposed in this alternative would not have any significant effects on the wilderness values of the refuge as pointed out in the preceding analysis. As discussed above, oil and gas exploration could result in some temporary impacts to vegetation (e.g., crushing along 360 to 480 miles of seismic lines - no more than 1,000 acres - and around core drilling sites - less than one acre per site), temporary displacement of sensitive wildlife during the period of activity, and visual impacts resulting from the presence of work crews of 50 or fewer people and from the vegetation impacts, thus affecting the naturalness of areas immediately adjacent to seismic lines and core drilling sites which could be located throughout the refuge. Increased mining activities would have impacts to naturalness and solitude (the result of increased human use, increased noise, increased air traffic, potential impacts to water quality and quantity, displacement of wildlife, surface disturbance, and the construction of facilities, although these impacts would generally be restricted to the mining site and the area immediately surrounding it (less than 8,000 acres). Opportunities for solitude would also be affected by noise and visual impacts from increasing recreational use (35 percent above current levels dispersed over a large area of the refuge) and from oil and gas exploration activities (on some 1,000 acres with 50 or fewer people involved), although impacts would be negligible in extent. There would be no significant impacts to opportunities for primitive recreation and the special features of the refuge under this alternative.

Effects on Prescribed Burning. Under the prescribed burning scenario for this alternative, four sites have been proposed for burning (additional burn sites could be proposed in the future). All the proposed sites are in the Flats Wilderness Review Unit. Each burn would cover 10,000 to 20,000 acres. No other habitat improvement techniques would be used on the refuge under the scenario for this alternative. The lack of a wilderness proposal for the Flats Unit under this alternative would not effect prescribed burning on the refuge.

Effects on Commercial Timber Harvest. Commercial timber harvest would not be allowed on the refuge under Alternative D. The lack of a wilderness proposal for 92 percent of the refuge under this alternative would not effect commercial timber harvest on the refuge.

Effects on Mining Activities. Not designating 92 percent of the refuge as wilderness would have no effect on hardrock mining activities on the refuge.

Under Section 304(c) of ANILCA all public lands ". . . in each National Wildlife Refuge . . . are hereby withdrawn, subject to valid existing rights, . . . from all forms of appropriation or disposal under the public land laws, including location, entry and patent under the mining laws . . ." The lack of a wilderness proposal for 92 percent would not effect hardrock mining on the refuge.

Effects on Oil and Gas Activities. Under this alternative 92 percent of the refuge would not be proposed for wilderness designation. Oil and gas exploration, including seismic, may occur on refuge lands under all management categories. However, seismic, core drilling, and other oil and gas studies involving the use of motorized equipment would not be permitted in designated wilderness unless conducted by (or for) an Interior Department agency pursuant to Section 1010 of ANILCA. Oil and gas leasing and development would not be permitted on the refuge under this alternative. However, leasing could occur in the future on areas of the refuge under minimal management which are not designated as wilderness (92 percent of the refuge). This area of the refuge could be open to leasing in the future through revision of the plan if leasing is determined to be in the national interest and is determined to be compatible with refuge purposes. Leasing would only be precluded if areas of the refuge were designated as wilderness.

Impacts on Area Proposed for Wilderness

Effects on Wilderness Values. Wilderness values would be preserved in the White-Crazy Mountains with congressional designation of the area as wilderness. There would be, however, a few impacts to wilderness values that would occur despite protection under the Wilderness Act.

Naturalness - Of the potential activities on the refuge, only oil and gas exploration activities would potentially have an impact on naturalness within the proposed wilderness area. Core drilling and seismic exploration could occur in the White-Crazy Mountains area of the refuge (if conducted by or for an agency of the Department of the Interior), under Section 1010 of ANILCA. As discussed previously, crushing of vegetation along seismic lines, temporary displacement of sensitive wildlife species from project sites, and limited visual impacts would occur. However, little exploration activity would be expected in the White-Crazy Mountains if wilderness designation occurs as oil and gas leasing would not be permitted. It is anticipated that less than 100 acres would be affected.

Placer mining activities and prescribed burning would not affect the naturalness of the White-Crazy Mountains. These activities would occur only in areas of the refuge which are not part of the wilderness proposal under this alternative.

Use levels, both subsistence and recreational, are currently very low in this area of the refuge. Even with recreational use projected to increase by 35 percent under this alternative, it is unlikely that the naturalness of the area would be affected by any increase in use with the possible exception of along Beaver Creek, a National Wild River, where contact between individual groups of recreational users may increase slightly.

Outstanding opportunities for solitude - Mining and prescribed burning would occur outside the proposed wilderness. These activities would have no effect on opportunities for solitude in the proposed wilderness. A few people

(50 or less) would be brought to the refuge to conduct oil and gas exploration activities, which could occur in the proposed wilderness (even if designated as wilderness). These activities, however, would occur during the winter when few wilderness users would be expected to use the refuge.

A slight increase in recreational use (35 percent as opposed to 25 percent under Alternative A) may occur as a result of wilderness designation. As current use levels are low, this projected increase in recreational use would not effect opportunities for solitude within the wilderness, with the possible exception being along Beaver Creek.

Outstanding opportunities for primitive recreation - Opportunities for primitive recreation are high in the proposed White-Crazy Mountains wilderness and would remain high under this alternative. Current use of the area is low and management activities proposed under this alternative would have little effect on future use of the area. As indicated previously, the only area within the proposed wilderness where user groups would possibly meet would be along Beaver Creek.

Special features - The most important special feature of the White-Crazy Mountains wilderness proposal are the White Mountains. Management activities proposed under this alternative would have negligible impact on the White Mountains. Most national resource species found on the refuge do not occur within this area, the exceptions being the three raptor species - bald and golden eagles and peregrine falcon. With few management activities proposed and use levels not expected to grow significantly, these species would not be adversely affected by designation of the area as wilderness.

Conclusion: Effects on wilderness values. The management actions proposed in this alternative would have no significant effects on the wilderness values of the White-Crazy Mountains area as pointed out in the preceding analysis. Oil and gas exploration could result in some temporary impacts (e.g., crushing of vegetation, displacement of wildlife, limited visual impacts, increased presence of humans) on the naturalness of the area (less than 100 acres), although designation of the area as wilderness would preclude oil and gas leasing. Opportunities for solitude and primitive recreation would not be significantly altered as a result of implementing Alternative D - only negligible impacts would be expected. Impacts to the special features of the unit resulting from implementation of this alternative would be negligible.

Effects on Prescribed Burning. Designating the White-Crazy Mountains as wilderness would have no effect on the proposed prescribed burning program on the refuge. All proposed prescribed burns are outside the area proposed for wilderness designation. Prescribed burning could occur in designated wilderness if it was decided at some future time that such burning would be desirable.

Effects on Commercial Timber Harvest. Designating the White-Crazy Mountains as wilderness would have no effect on potential commercial timber harvest on the refuge. Commercial timber harvest would not be permitted anywhere on the refuge under this alternative. Even if commercial timber harvest were allowed, it is very unlikely that harvest activities would occur in this area of the refuge due to limited timber potential of most of the area, the remoteness of the area (lack of access), and the high expenditure which would be required to harvest timber from this area of the refuge.

Effects on Mining Activities. Designation of the White-Crazy Mountains area as wilderness would not affect mining activities on the refuge. No active claims are located in this area of the refuge according to Bureau of Land Management records and under Section 304(c) of ANILCA all public lands ". . . in each National Wildlife Refuge . . . are hereby withdrawn, subject to valid existing rights, . . . from all forms of appropriation or disposal under the public land laws, including location, entry and patent under the mining laws . . ."

Effects on Oil and Gas Activities. Under this alternative, oil and gas leasing and development would not be permitted on the refuge, although leasing could occur in the future if it was determined to be in the national interest and it was determined to be compatible with refuge purposes (with revision of the plan). However, oil and gas leasing would not be allowed in the White-Crazy Mountains (650,000 acres) if the area is Congressionally designated as wilderness. Oil and gas exploration, including seismic activities, would also be limited if the area is designated as wilderness. Although allowed in wilderness, seismic exploration, core drilling, and other oil and gas exploration activities involving the use of motorized equipment would only be allowed in designated wilderness if conducted by (or for) an agency of the Department of the Interior pursuant to Section 1010 of ANILCA.

ALTERNATIVE E

Alternative E would maintain the existing range and intensity of management and recreational and economic uses on the refuge. All refuge lands would be proposed for wilderness designation.

Scenarios

The scenarios developed for Alternative E depict projected future levels of prescribed burning on the refuge and levels of oil and gas exploration and development, mining, and commercial timber harvest on the refuge. These scenarios are hypothetical depictions of what might occur in the future and are used only for purposes of analysis and comparison of impacts with the other alternatives.

Prescribed Burning. A number of techniques are available for terrestrial habitat improvement and could potentially occur on the Yukon Flats Refuge under the various management categories. Prescribed burning is considered by the refuge to be the only viable technique available to restore and enhance wildlife habitats on the refuge (wildfire - natural or man-caused - will have similar effects on wildlife habitats). Prescribed burning is the only habitat improvement technique proposed by the refuge staff for use on the refuge and is the only technique which would be allowed in minimal management or designated wilderness. No other habitat improvement techniques (mechanical manipulation or water impoundments and diversions) are expected to be implemented on the refuge in the near future. Such techniques are impractical due to the lack of accessibility to most areas of the refuge, the significant logistical requirements necessary to implement these techniques, and the prohibitive costs. Under Alternative E, prescribed burning would be the only

technique permitted as all refuge lands would be categorized as minimal management and would be proposed for designation as wilderness.

The prescribed burning scenario for Alternative E assumes that the same projects will be undertaken as are identified in the Alternative A scenario with the same assumptions and constraints being applied. Four burn sites have been identified and, depending on the success of these burns in meeting their intended objectives, additional sites may be identified for future burning. See the prescribed burning scenario under Alternative A.

Commercial Timber Harvest. In Alternative E all refuge lands would be designated as minimal management areas and would be proposed for designation as wilderness. Wilderness and minimal management categories both preclude commercial timber harvest activities. For the purposes of analysis it is therefore assumed that commercial timber operations would not occur on the refuge over the next 50 years.

Placer Mining. With only four active mining claim case files on record with the BLM, mining activities on the refuge are currently limited primarily to that necessary for annual assessments as prescribed in the Mining Law of 1872. Since the annual assessment required by this law is only $100 per claim, very little activity actually occurs on the claims (one trip to a claim during a season would cover the required assessment outlay). Such activity results in only negligible impacts. For the purposes of this scenario, it is assumed that mining activities on the refuge would not expand beyond the current level over the next 50 years.

Oil and Gas Exploration and Development. In Alternative E, geologic exploration, including surface rock collecting, gravimetric surveying, and geological mapping activities would be permitted on a site-specific basis throughout the refuge. These activities require essentially no surface disturbance. In addition, seismic surveying and subsurface core drilling could be permitted refuge-wide although activities requiring use of motorized equipment, such as core drilling and seismic activities, would be restricted to activities being done by (or for) an agency of the Department of the Interior in accordance with Section 1010 of ANILCA. Specific seismic survey methods permitted would be determined by the refuge manager based on specific study needs and the resources which may be impacted. Core drilling and seismic activities, because of the expense involved, will likely be limited to those in association with the Alaska Mineral Resources Assessment Program or to complete data collection on other lands. The scenario for oil and gas exploration and development, including assumptions, is the same as described in the Alternative A scenario, although the amount of seismic activity would be only half that under Alternative A (180 to 240 miles of seismic lines).

Biological Effects of Alternative E (Life of the Plan - 15 Years)

Vegetation. Impacts on vegetation would be similar to those describe in Alternatives A and D. Changes in vegetation would primarily be successional changes resulting from natural events (wildfire and flooding), prescribed fire (four burns of 10,000 to 20,000 acres each), and oil and gas exploration.

Wildlife. Impacts under this alternative would be similar to those described for Alternatives A and D, although all of the refuge would be

recommended for wilderness designation. This designation would give maximum protection and continuity of management to all wildlife resources on the refuge. Seismic activities may be allowed in designated wilderness, but only if conducted by (or for) an agency of the Department of the Interior in accordance with Section 1010 of ANILCA. Only localized negligible impacts would result from seismic and other geologic exploration activities as in Alternative A (only half the number of seismic lines would be completed). Prescribed burning (four burns of 10,000 to 20,000 acres each to be burnt on a biannual basis) would have mixed impacts on wildlife. Waterfowl species would benefit if burns occur in areas where lakes and ponds are low in nutrients, but in areas where production is currently high loss of nesting and rearing habitat could occur. Moose and other species which utilize early successional habitats as a source of food would benefit from prescribed fire, however, there could be a short-term loss of habitat for other species. Because prescribed burning projects would be limited in scope, impacts resulting from the projects would be localized and generally negligible in extent.

Fisheries. Impacts under this alternative would be similar to those in Alternatives A and D, except all of the refuge would be recommended for wilderness designation. This designation would provide maximum protection and continuity of management to all fisheries resources on the refuge. Seismic exploration may be allowed in designated wilderness, but only if conducted by (or for) an agency of the Department of the Interior in accordance with Section 1010 of ANILCA. Seismic and other geologic exploration activities would have localized negligible to moderate impacts on fishery resources as described under Alternative A (only half the seismic activities would occur). No biological effects are expected from the limited amount of mining activity occurring on mining claims on the refuge, although mining activities outside the refuge could potentially have a major adverse impact on refuge fisheries (as described under Alternative A). With water quality monitoring, strict enforcement of State Water Quality Standards,and studies to monitor baseline fish populations and to locate spawning and rearing areas of various fish species, only minor impacts would be expected. Proposed prescribed burning would be monitored and impacts, if any, would be minor, primarily associated with possible increases in run-off and sedimentation of streams in the project areas and subsequent impacts on fishery resources.

Water Quality and Quantity. Water quality and quantity would remain basically unchanged over the long term under Alternative E. As discussed under Alternative A, negligible short-term impacts may occur in localized areas of the refuge. Recreation use would increase (up to 50 percent to a total of 1,500 visitor use days annually) if the refuge were to be designated wilderness by Congress (all refuge lands are proposed for designation under this alternative). This increase would not be significant over the next 10 to 15 years. Any potential impacts to water quality resulting from this increase would be negligible. Seismic activities may result in minor, localized impacts to water quality, although impacts would be negligible if air-transported seismic equipment is used and clearcutting of vegetation in seismic lines is not done. Prescribed burning would have negligible impacts on water quality unless a burn escapes and it becomes necessary to utilize heavy equipment in constructing firelines or for other suppression activities.

Visual and Air Quality. Management directions in this alternative would remain basically the same as in Alternatives A and D, although all refuge

lands would be recommended for wilderness designation. Seismic activities, if done using helicopter-transported equipment and without clearcutting seismic lines, would result in negligible short-term visual impacts. Prescribed burning would simulate wildfire thus having only negligible visual impacts. Short-term impacts to air quality would occur, but burns would occur when smoke would be directed away from populated areas. Visual and air quality would not change significantly under this alternative.

Socioeconomic Effects of Alternative E (Life of the Plan - 15 Years)

Population. The effects of implementing Alternative E on the population of refuge communities would be similar to those discussed under Alternatives A and D, although all of the refuge would be recommended for designation as wilderness in this alternative. Even with congressional designation of all or a portion of the refuge as wilderness, recreational use would be projected to increase no more than 50 percent (to a total of 1,500 visitor use days annually), only 25 percent higher than projected for Alternative A. This increase in the transient population would be negligible.

Social Conditions. Impacts on social conditions resulting from implementation of this alternative would be similar to those discussed under Alternative A and D. The traditional lifestyle of local residents would not be altered. Interaction between communities would not be effected. Only a negligible increase in local/non-local interaction would occur, resulting primarily from seasonal workers involved in seismic and other exploration activities and from a small increase in recreation users should any of the refuge be designated as wilderness by Congress.

Economy. Economic effects of implementing Alternative E would be similar to those discussed under Alternatives A and D. Most economic uses and facilities would not be permitted on the refuge. Only a very limited number of new jobs would be expected, either for local residents or for non-locals. Only negligible change in local and regional economies would occur.

Recreation. Recreational use would increase more than projected for Alternatives A and D (up to 50 percent, to a total of 1,500 visitor use days, compared to 25 percent in Alternative A and 35 percent in Alternative D). Recreational use of the refuge would grow at a slightly faster rate than under Alternatives A and D as a result of Congressional designation of wilderness on the refuge (all refuge lands are proposed compared to eight percent under Alternative D). This increase, however, would not be a significant factor in total public use of the refuge and would have negligible impacts on refuge resources.

Cultural Resources. The effects of implementing Alternative E on cultural resources found on the refuge would be similar to those discussed under Alternatives A and D. Recreational use would not increase significantly over the next 10 to 15 years, although some growth would be anticipated (up to 50 percent, or 500 visitor use days) if the refuge is designated as wilderness by Congress (as recommended). Potential impacts to cultural resources would be minimized or avoided by completing site-specific inventories and evaluations and through use of mitigation and preservation measures. Any impacts would be negligible.

Subsistence/Section 810(a) Evaluation and Finding. The following section examines the impacts on subsistence that would result from implementation of Alternative E. It conforms to the guidelines recommended by the Alaska Land Use Council for complying with Section 810 of ANILCA.

Alternative E is similar to Alternative D in that it would have only negligible impacts on subsistence use of the refuge. In Alternative E, all refuge lands would be proposed for wilderness designation. Recreational use of the refuge would increase (up to 50 percent, or 500 visitor use days) at a slightly faster rate over the next 10 to 15 years than under Alternatives A and D (up to 25 percent under Alternative A; 35 percent under Alternative D). Only a negligible increase in competition for refuge resources over the long term would result from this increase in recreational use.

Placer mining, oil and gas exploration, and prescribed burning, as described in the scenarios for this alternative, would generally have only negligible localized impacts on subsistence resources and subsistence activities on the refuge. Implementation of Alternative E would, therefore, have only negligible effects on the subsistence way of life.

Availability of Other Lands - Section 810(a) requires that the availability of other lands be considered in evaluating the effect of refuge management alternatives on subsistence uses. This plan is a refuge plan by definition and addresses the general suitability of a broad range of activities for refuge lands. Thus, although other lands may be available for the uses considered, lands outside of the refuge are not considered because they are beyond the scope of this plan.

Other Alternatives - Consideration of other alternatives is also required by Section 810(a). Five management alternatives have been analyzed for the refuge. Alternative E is similar to Alternative A in that all refuge lands would be classified as minimal management. It differs from Alternative A in that all refuge lands would also be proposed for wilderness designation. In addition placer mining activities would increase above current levels. This activity, however, would directly impact less than 10 acres annually, resulting in only localized negligible impacts to subsistence resources. Opportunities to participate in subsistence activities would be maintained.

Alternative A, the current situation, has few impacts on the subsistence way of life. All refuge lands would be classified as minimal management. Alternative D, the Service's preferred alternative, is similar to Alternative A in that all refuge lands would be under minimal management. It differs from Alternative A in that eight percent of the refuge would be proposed for designation as wilderness. Under these two alternatives, opportunities to participate in subsistence activities would be maintained and implementation would have negligible effects on the subsistence way of life, although the presence of seismic crews on the refuge may intensify the concerns of local residents about overuse of the resources and interference with their subsistence lifestyle. Placer mining activities would increase in Alternative D, as well, although few impacts would result from these activities.

Alternative C may open about one fourth of the refuge to oil and gas development and associated activities, resulting in localized, long-term impacts to resources taken by subsistence users. Although opportunities to participate in subsistence activities would not be affected, the presence of oil and gas workers on the refuge would intensify the concerns of local residents about overuse of the resources and interference with their subsistence lifestyle. Alternative B would allow oil and gas leasing and

development and commercial timber harvest on 68 percent of the refuge. Other economic uses and public facilities would be permitted on 22 percent of the refuge. Although opportunities to participate in the subsistence lifestyle would not be significantly altered, improved access, increased recreational use, and more economic development would result in long-term impacts to subsistence resources and activities and increased concern by local residents that their subsistence lifestyle would be threatened.

Other alternatives were considered during early stages in the planning process. Many of these alternatives fell within the range of alternatives which are evaluated in this document and would result in variations of the impacts discussed previously. Other alternatives opened more of the refuge to develoment of public facilities and economic uses. These alternatives were determined not to meet refuge purposes as outlined in ANILCA and were, therefore, not evaluated further in this document.

Finding - Implementation of Alternative E would not result in a significant restriction of subsistence uses on the refuge.

Wilderness Designation Effects of Alternative E (50 Years)

In Alternative E, the Service would propose that all 8.48 million acres of federal land on the refuge be added to the National Wilderness Preservation System. Long-term Congressional protection would be provided to all fish and wildlife habitats found on the refuge.

Impacts on Area Proposed for Wilderness

Effects on Wilderness Values. All refuge lands are proposed for wilderness designation in Alternative E, thus preserving wilderness values on these lands. There are, however, a few impacts to wilderness values that will occur despite protection under the Wilderness Act.

Naturalness - Activities which would be allowed on the refuge and which could affect naturalness in the short and long term include prescribed burning, core drilling, and seismic exploration. Core drilling and seismic exploration, although allowed throughout the refuge, would most likely occur in the area of the refuge where oil and gas potential is moderate (68 percent of the refuge, see Figure 7). These activities could continue in designated wilderness, although activities requiring the use of motorized equipment could only be undertaken by (or for) an agency of the Department of the Interior pursuant to Section 1010 of ANILCA. These activities would occur during the winter. Crushing of vegetation would occur along the 180 to 240 miles of seismic lines (within a 20 foot right-of-way, less than 500 acres) and in a small area at each core drilling site (less than one acre per site). Sensitive wildlife, primarily wolves and wolverines, would be temporarily displaced from the areas where seismic activities and core drilling would occur. Most other species sensitive to disturbance (e.g., swans, bald eagles, peregrine falcon, ospreys, and grizzly bears) would not be present during the winter months. Visual impacts would also be evident as people (50 or less) and equipment would be present in the project areas and crushing of vegetatio would occur. Because of the short duration and limited extent of these activities, any impacts to the naturalness of the refuge would be short-term and negligible.

Mining activities on the refuge would continue to be generally limited to annual visits to the claims with little or no actual mining activity occurring (to meet the 100 dollar per claim assessment requirement of the Mining Law of 1872). Impacts of mining on naturalness associated with this level of activity would be confined to impacts associated with travel to and from the claims, the presence of people on claims for a short period (probably no more than two weeks) each summer, limited site clearing, and possibly some installation of machinery or structures. Disturbance of surface vegetation would be very localized, with a maximum of 10 acres being affected in the refuge. Recreational use, although expected to increase by up to 50 percent (to a total of 1,500 visitor use days annually), would not affect the naturalness of the refuge because of the limited number of visitors in comparison to the large size of the refuge.

Prescribed burning projects (four burns of 10,000 to 20,000 acres each, to be burnt on a biannual basis) would have little effect on the naturalness of the refuge. Burn sites would appear generally the same as if a wildfire had burnt the site. Wildfire is considered a natural part of refuge ecosystems.

Outstanding opportunities for solitude - Mining activities are projected to remains at current levels (activity primarily associated with meeting the assessment work required by the Mining Law of 1872). However, a small degree of disruption to solitude would occur from noise generated through travel to and from the claims and from the operation of equipment at the claims. Solitude is expected to be affected on less than 100 acres for no more than 30 days each year.

A small number of people (50 for core drilling, less for seismic activities and mapping) would be involved in oil and gas exploration activities on the refuge. With activities occurring primarily during the winter, opportunities for solitude on the refuge would not be affected by oil and gas exploration activities.

Recreational use would increase by up to 50 percent. Subsistence use would change only as the regional population grows. Such changes would not be enough to effect opportunities for solitude on the refuge. Users during hunting season may occasionally encounter other parties. However, except for limited contact along major river systems, outstanding opportunities for solitude would still exist.

Outstanding opportunities for primitive recreation - Recreational use would increase by up to 50 percent (to a total of 1,500 visitor use days annually) under this alternative. This increase in recreational use would result in a slight decrease in opportunities for primitive recreation on the refug, with most of the impact concentrated along major waterways on the refuge. Core drilling and seismic exploration (would occur primarily during the winter with only a small number of people involved (50 or fewer). Mining activities, because of the limited number of active claims and the lack of mining activity, would result in only negligible impacts (less than 10 acres would be affected, primarily in areas not use by most recreational users).

Special features - The special features of the refuge include the Yukon River and its tributaries; the Yukon Flats; the White Mountains; highly productive lynx habitat in the Black River drainage; and 15 national resource species (both wildlife and fish). Oil and gas exploration activities and mining, as identified in the scenarios for this alternative, would be limited

in scope and/or of a short-term nature which would not adversely affect any of the special features of the refuge. Oil and gas exploration activities could continue in designated wilderness, although activities requiring the use of motorized equipment could only be undertaken by (or for) an agency of the Department of the Interior pursuant to Section 1010 of ANILCA.

Recreational use would increase by up to 50 percent (to a total of 1,500 visitor use days annually). This increase would not effect the special values of the refuge.

Prescribed burning (four burns of 10,000 to 20,000 acres each to be burnt on a biannual basis) would result in temporary loss of vegetation from the burn area (regeneration would be evident within 30 days of the burn) and temporary displacement of wildlife species found on the burn sites, but in the long term burns would improve habitats for many species (such as waterfowl, moose, and various furbearer species).

Conclusion: Effects on wilderness values. The management actions proposed in this alternative would not have any significant effects on the wilderness values of the refuge as pointed out in the preceding analysis. As discussed above, oil and gas exploration could result in some temporary impacts to vegetation (e.g., crushing along 180 to 240 miles of seismic lines - no more than 500 acres - and around core drilling sites (less than one acre per site), temporary displacement of sensitive wildlife during the period of activity, and visual impacts resulting from the presence of work crews of 50 or fewer people and from the vegetation impacts), thus affecting the naturalness of areas immediately adjacent to seismic lines and core drilling sites which could be located throughout the refuge. Opportunities for solitude would be affected by noise and visual impacts from mining activities (on less than 100 acres) and from oil and gas exploration activities (on less than 500 acres with 50 or fewer people involved), although impacts would be negligibel in extent. Recreational use, projected to increase by up to 50 percent, would have some minor impacts to opportunities for solitude and primitive recreation, primarily along the major waterways of the refuge. There would be no significant impacts to the special features of the refuge under this alternative.

Effects on Prescribed Burning. Designating all or significant parts of the refuge as wilderness would have no effect on the proposed prescribed burning program on the refuge. Prescribed burning would be allowed in designated wilderness.

Effects on Commercial Timber Harvest. Designating all or significant parts of the refuge as wilderness would have no effect on potential commercial timber harvest on the refuge under this alternative. Commercial timber harvest would not be allowed anywhere on the refuge under this alternative (all refuge lands in the minimal management category). However, Congressional designation of the refuge as wilderness would preclude commercial timber harvest from ever occurring on the refuge (without congressional approval).

Effects on Mining Activities. Designation of all or significant parts of the refuge as wilderness would have minimal affect on mining activities on the refuge. A limited number of mining claims are located on the refuge according to Bureau of Land Management records. Under Section 1110(b) of ANILCA, "adequate and feasible access for economic and other purposes" are guaranteed to "the State or private owner or occupier" of lands within or effectively

surrounded by one or more conservation system units (including units of the National Wilderness Preservation System). Under Section 304(c) of ANILCA all public lands ". . . in each National Wildlife Refuge . . . are hereby withdrawn, subject to valid existing rights, . . . from all forms of appropriation or disposal under the public land laws, including location, entry and patent under the mining laws . . ." Therefore, no new mining claims can be filed on the refuge.

Effects on Oil and Gas Activities. Under this alternative, oil and gas leasing and development would not be permitted on the refuge, although leasing could occur in the future if it was determined to be in the national interest and to be compatible with refuge purposes (with revision of the plan). However, if all refuge lands are Congressionally designated as wilderness oil and oil and gas leasing would not be allowed (without congressional approval). Oil and gas exploration, including seismic activities, would also be limited if wilderness designation should occur on any or all of the refuge. Although allowed throughout the refuge, seismic exploration, core drilling, and other oil and gas exploration activities involving the use of motorized equipment would not be allowed in designated wilderness unless conducted by (or for) an agency of the Department of the Interior pursuant to Section 1010 of ANILCA.

MITIGATION

Adverse impacts resulting from the implementation of the Yukon Flats Refuge Comprehensive Conservation Plan will be mitigated whenever and wherever possible, relative to the goals and objectives of the plan being implemented. The Service will promulgate regulations, develop stipulations, and issue permits to mitigate other impacts. These regulations, stipulations, and permits will mitigate impacts by a variety of means: avoiding the impact altogether; minimizing the impact by limiting the degree or magnitude of the action; rehabilitating or restoring the affected environment; and compensating for the impact by replacing or providing substitute resources or environments. Mitigation may consist of standard stipulations, such as those attached to oil and gas leases; special stipulations which may be attached to various types of leases or permits on a site-specific basis; and site-specific, project-specific mitigation identified through detailed step-down management plans or the environmental assessment process. The degree, type, and extent of mitigation undertaken will depend on the site-specific conditions present and the management goals and objectives of the action being implemented.

SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

In Alternatives A, D, and E, the primary short-term uses of the refuge would be for subsistence and recreational purposes. Utilization of subsistence resources, such as moose, salmon, and various furbearers, would occur. Some displacement of individual animals or isolated population groups would occur as a result of oil and gas exploration, prescribed burning, placer mining, and other permitted activities. With monitoring and regulation by ADF&G and the Service, only negligible loss of long-term productivity would occur.

Oil and gas activities and other economic uses allowed in Alternative B have the potential to affect the long-term productivity of refuge resources in areas of the refuge under intensive and moderate management. Significant loss

of productivity would result if oil and gas leasing and associated development, timber harvest, sand and gravel extraction, or other economic activities occur. Loss in productivity would be expected in these areas as habitats of waterfowl, moose, furbearers, and other species would be altered and animals that traditionally use these areas would be displaced. In time, altered areas such as gravel pits, pipeline corridors, and roads would probably recover - with proper rehabilitation - to approximate pre-project levels of productivity. Only negligible loss of productivity would result from seismic exploration activities, as this activity would occur primarily during winter months. Mechanical manipulation and water impoundments and diversions (although not currently projected to occur on the refuge) would result in minor short-term loss of productivity, but would increase productivity over the long term. If permitted activities are properly conducted in accordance with environmentally sound regulations and stipulations, there should be no significant sacrifices of long-term productivity on the refuge.

In Alternative C, oil and gas leasing and commercial timber harvest would be permitted on over one quarter of the refuge and oil and gas exploration, including seismic, would be permitted throughout the refuge. The impacts of these activities on long-term productivity on the refuge would be similar to those discussed for Alternative B. Mechanical manipulation and water impoundments and diversions (although not currently projected to occur) would also be permitted on over one quarter of the refuge with impacts similar to those discussed under Alternative B.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The commitment of staff time and dollars to any alternative is an irreversible and irretrievable commitment which cannot be avoided. In Alternatives B and C there could be several irreversible and irretrievable commitments due to oil and gas activities. The removal of petroleum products, should any development occur, would constitute one such irretrievable commitment of natural resources. Removal of gold through placer mining would be another irretrievable commitment of natural resources. Increased noise, presence of people and machinery, and alteration of the landscape resulting from the development of oil and gas or placer mining would affect the wilderness qualities of those areas of the refuge in intensive and moderate management. Although the landscape could be reclaimed following production, it would never be exactly the same as it is currently. Recreational facilities and other types of economic development would have similar effects on the wilderness qualities of areas in intensive management in Alternative B. The excavation or unknowing destruction of cultural resources during oil and gas operations, habitat improvement activities, placer mining, or other activities occurring on the refuge would also be an irreversible and irretrievable commitment of resources. Pre-project surveys and investigations would be undertaken to minimize this potential loss.

VII. EVALUATION OF THE ALTERNATIVES

EVALUATION OF THE ALTERNATIVES

Selecting a preferred management alternative involves determining how well each alternative satisfies criteria or standards set forth by the decisionmaker. This section evaluates each of the five alternatives for the Yukon Flats Refuge against two evaluation criteria and proposes one of the alternatives as the preferred plan for managing the refuge.

Table 19 (in Alternatives Chapter) summarizes each of the alternatives and compares the major differences in management directions. As noted previously, although all alternatives were designed to meet political, financial, technical, and legal tests of feasibility, each alternative has a different management emphasis.

EVALUATION CRITERIA

To select the preferred alternative, and minimize subjectivity, the alternatives were compared using two criteria:

- to what extent the alternative satisfies the purposes of the refuge and other provisions of ANILCA.
- to what extent the alternative satisfies the issues and concerns of the public and the Service.

The most important criterion in evaluating the alternatives is the degree to which the alternative achieves the four purposes of the refuge, as mandated by ANILCA. These purposes, as set forth in section 302(9)(B) of ANILCA, are:

(i) to conserve fish and wildlife populations and habitats in their natural diversity including, but not limited to, canvasbacks and other migratory birds, Dall sheep, bears, moose, wolves, wolverines and other furbearers, caribou (including participation in coordinated ecological studies and management of the Porcupine and Fortymile caribou herds) and salmon;

(ii) to fulfill the international treaty obligations of the United States with respect to fish and wildlife and their habitats;

(iii) to provide, in a manner consistent with the purposes set forth in subparagraphs (i) and (ii), the opportunity for continued subsistence uses by local residents; and

(iv) to ensure, to the maximum extent practicable and in a manner consistent with the purposes set forth in paragraph (i), water quality and necessary water quantity within the refuge.

Table 20 compares the alternatives based on refuge purposes indicating how well each alternative satisfies this criterion.

Table 20. Evaluation of alternatives based on refuge purposes.

Refuge Purposes	Alternative A (Current Situation)	Alternative B	Alternative C	Alternative D (Preferred)	Alternative E
(i) to conserve fish and wildlife populations and habitats in their natural diversity including, but not limited to, canvasbacks and other migratory birds, Dall sheep, bears, moose, wolves, wolverines and other furbearers, caribou (including participation in coordinated ecological studies and management of the Porcupine and Fortymile caribou herds) and salmon;	High potential for maintaining natural diversity and abundance of fish and wildlife populations and habitats while continuing to provide for current levels of traditional use and access.	Least potential for maintaining natural diversity and abundance of fish and wildlife populations and habitats while continuing to provide for current levels of traditional use and access.	Low potential for maintaining natural diversity and abundance of fish and wildlife populations and habitats while continuing to provide for current levels of traditional use and access.	High potential for maintaining natural diversity and abundance of fish and wildlife populations and habitats while continuing to provide for current levels of traditional use and access.	High potential for maintaining natural diversity and abundance of fish and wildlife populations and habitats while continuing to provide for current levels of traditional use and access.
(ii) to fulfill the international treaty obligations of the United States with respect to fish and wildlife and their habitats;	Good opportunity to protect sensitive fish and wildlife habitats in compliance with international treaties.	Most potential to adversely affect sensitive fish and wildlife habitats.	High potential to adversely affect sensitive fish and wildlife habitats.	Good opportunity to protect sensitive fish and wildlife habitats in compliance with international treaties.	Good opportunity to protect sensitive fish and wildlife habitats in compliance with international treaties.
(iii) to provide, in a manner consistent with the purposes set forth in subparagraphs (i) and (ii), the opportunity for continued subsistence uses by local residents; and	Good opportunity to provide for continued subsistence use of refuge resources by local residents, while maintaining the natural diversity and abundance of fish and wildlife.	Maintains opportunity for continued subsistence use of refuge resources by local residents, but has significant potential for adverse impacts to and increased competition for subsistence resources.	Maintains opportunities for continued subsistence use of refuge resources by local residents, but has significant potential for adverse impacts to and increased competition for subsistence resources.	Good opportunity to provide for continued subsistence use of refuge resources by local residents while maintaining the natural diversity and abundance of fish and wildlife.	Good opportunity to provide for continued subsistence use of refuge resources by local residents while maintaining the natural diversity and abundance of fish and wildlife.
(iv) to ensure, to the maximum extent practicable and in a manner consistent with the purposes set forth in paragraph (i), water quality and necessary water quantity within the refuge.	High potential to protect important watersheds, maintain water quality, and ensure necessary water quantity by limiting surface disturbing activities.	Greatest potential to adversely affect water quality and quantity on the refuge.	Has some potential to adversely affect water quality and quantity on the refuge.	High potential to protect important watersheds, maintain water quality, and ensure necessary water quantity by limiting surface disturbing activities.	High potential to protect important watersheds, maintain water quality, and ensure necessary water quantity by limiting surface disturbing activities.

Table 21 summarizes the potential biological and socioeconomic impacts of the alternatives. None of the alternatives would result in major adverse impacts to the refuge in its entirety, although major localized impacts to specific resources or user groups would occur under Alternatives B and C. Three of the five alternatives, Alternatives A, D, and E, would pose few risks to the refuge resources, subsistence and recreational users, and the local communities. The impacts that may occur would be negligible short-term impacts and would generally result from natural phenomena or the increasing human population in the region and in the state as a whole. Limited placer mining activities, oil and gas exploration, and prescribed burning would occur on the refuge under Alternatives D and E. Impacts from these activities, however, would generally be of a short-term and localized nature with only negligible effects refuge-wide. These three alternatives would fulfill all the refuge purposes as set forth by ANILCA.

Alternative B has the most potential economic benefits and environmental risks of the alternatives, primarily because of oil and gas leasing (may be allowed on 68 percent of the refuge). Other economic uses, as well as some recreational facilities, would also be allowed under this alternative. If a commercial petroleum deposit is discovered, the resulting revenues would positively benefit local entities, the state, and the nation. Recreational use of the refuge would also increase substantially (although not significantly when considering total public use including subsistence) in Alternative B, providing some economic benefits to local businesses.

Alternative C may allow oil and gas exploration throughout the refuge and leasing on about one quarter of the refuge. If a commercial petroleum deposit is found, the resulting revenues would benefit local entities, the state, and the nation. Recreational use of the refuge would increase, but not to the same extent as would be anticipated under Alternative B.

Alternatives B and C could, in addition to positive economic benefits, have several adverse impacts. With adequate environmental regulation, many potential impacts from oil and gas exploration, leasing, and development, commercial timber harvest, placer mining, prescribed burning, and other potential uses of the refuge allowed in Alternative B could be minimized or eliminated. Even with environmental controls, however, loss of habitat, disruption of fish and wildlife populations, and other impacts could occur. Of primary concern on the Yukon Flats Refuge is the potential for significant localized impacts, both short and long-term, to waterfowl, moose, and fish populations and habitats and to water quality, particularly in lowland areas around the communities of Beaver, Birch Creek, Fort Yukon, and Chalkyitsik (areas dominated by wetland habitats and where most development activities would likely occur). Other species, such as caribou, bear, and peregrine falcon, could also be adversely affected. The Service would have to carefully monitor developments and areas of operation to keep adverse impacts to a minimum.

Alternative C, which may allow oil and gas leasing and development and commercial timber harvest on 26 percent of the refuge, but not many of the other activities permitted in Alternative B, would result in impacts similar to those in Alternative B. These impacts, however, would not be as areally extensive as under Alternative B as less of the refuge would be open to these activities.

Under Alternative B, oil and gas exploration, leasing, and development, other economic activities, and increasing recreational use of the refuge would result in some adverse social impacts to communities on or near the refuge.

Table 21. Summary of the biological and socioeconomic impacts resulting from the five alternatives, Yukon Flats Refuge.

Element Evaluated	Alternative A (Current Situation)	Alternative B	Alternative C	Alternative D (Preferred)	Alternative E
Vegetation	Successional changes primarily from wildfire and flooding	Most potential for manipulation of vegetation; set back in plant succession may result from human activities--oil and gas exploration and leasing, timber harvest, mining, and prescribed burning; localized long-term loss of productivity may occur at development sites	High potential for manipulation of vegetation; set back in plant succession may result from human activities--oil and gas exploration and leasing, timber harvest, mining, and prescribed burning; localized long-term loss of productivity may occur at development sites	Successional changes primarily from wild and prescribed fire, flooding, oil and gas exlporation, and mining--primarily localized changes	Successional changes primarily from wild and prescribed fire, flooding, oil and gas exploration, and mining--primarily localized changes
Wildlife					
General	All species and habitats protected to preserve natural diversity; changes in populations and habitats would result from natural fluctuations and increasing human populations	Moderate impacts to species and habitats in areas of development; impacts to natural diversity would be minimized by regulating use	Moderate impacts to species and habitats in areas of development; impacts to natural diversity would be minimized by regulating use	All species and itats protected to preserve natural diversity; maximum protection in the White Mts. with wilderness designation	Maximum protection of all species and habitats to preserve natural diversity on the refuge with wilderness designation
Waterfowl	Waterfowl species and habitats protected to preserve natural diversity; negligible impacts from wildfire, flooding, and limited activities currently occurring on refuge	Oil and gas development could adversely affect over 75% of the refuge's wetland habitat (direct habitat loss and disturbance of populations); prescribed burning, timber harvest, mining, and other allowed activities would have negligible impacts	Oil and gas development would adversely affect up to 40% of the refuge's wetland habitat (direct habitat loss and disturbance of populations); prescribed burning, timber harvest, mining, and other allowed activities would have negligible impacts	Waterfowl species and habitats protected to preserve natural diversity; negligible adverse impacts from natural events (wildfire and flooding), prescribed burning, burning, oil and gas exploration, and mining	Maximum protection of waterfowl populations and habitats on the refuge with wilderness designation; negligible adverse from natural events (wildfire and flooding), prescribed burning, oil and gas exploration, and mining

Table 21. Summary of the biological and socioeconomic impacts resulting from the five alternatives, Yukon Flats Refuge (cont.).

Element Evaluated	Alternative A (Current Situation)	Alternative B	Alternative C	Alternative D (Preferred)	Alternative E
Wildlife (cont.)					
Moose	Set back in plant succession due to regeneration of browse along streams (from flooding and bank cutting) and in wildfire burn areas would benefit moose (by improving habitat)	Set back in plant succession from prescribed fire, timber harvest, mining, oil and gas exploration, and other allowed activities would be beneficial; minor loss of habitat from development; increasing use and improved access could result in higher moose harvest	Set back in plant succession from prescribed fire, timber harvest, mining, oil and gas exploration, and other allowed activities would be beneficial; minor loss of habitat from development; increasing use and improved access could result in higher moose harvest	Set back in plant succession from natural events (wildfire and flooding), prescribed fire, oil and gas exploration, and mining would benefit moose (by improving habitat)	Set back in plant succession from natural events (wildfire and flooding), prescribed fire, oil and gas exploration, and mining would benefit moose (by improving habitat)
Caribou	Traditional migration routes and habitats protected; changes in population/habitats mainly from natural fluctuations and increases in human population	Populations, migration patterns, and habitats could be affected by oil and gas and other development activities; increasing use and improved access could result in harvest of more caribou	Populations, migration patterns, and habitats could be affected by oil and gas and other development activities; increasing use could to increased use result in harvest of more caribou	Caribou migration and use areas protected; maximum protection in White Mts. with wilderness designation	Maximum protection of caribou migration routes and use areas with wilderness designation
Bear	Bear/human conflicts not expected to increase; changes in populations and habitats mainly the result of natural fluctuations and increasing human populations	Significant increase in bear/human conflicts due to more economic development and public use on refuge; increasing use and improved access would result in more hunting	Significant increase in bear/human conflicts due to more economic development and public use on refuge; increasing use would result in more hunting	Negligible increase in bear/human conflicts with wilderness designation in White Mts. (more recreational use)	Negligible increase in bear/human conflicts with wilderness designation of the refuge (more recreational use)
Furbearers	Some species may receive negligible benefit from wildfire; no anticipated adverse impacts	Limited benefits from fire; development could result in localized habitat loss; increased trapping pressure may occur	Limited benefits from fire; development could result in localized habitat loss; increased trapping pressure may occur	Some species may benefit from natural events (wildfire and flooding) and from prescribed fire; no anticipated adverse impacts	Some species may benefit from natural events (wildfire and flooding) and from prescribed fire; no anticipated adverse impacts
Peregrine Falcon	No change in current status anticipated	Increased activity around nest sites (including increased aircraft use) may disturb peregrines unless special stipulations are used	Increased activity around nest sites (including increased aircraft use) may disturb peregrines unless special stipulations are used	No change in current status anticipated	No change in current status anticipated

Table 21. Summary of the biological and socioeconomic impacts resulting from the five alternatives, Yukon Flats Refuge (cont.).

Element Evaluated	Alternative A (Current Situation)	Alternative B	Alternative C	Alternative D (Preferred)	Alternative E
Fisheries	Minor impacts may result from limited reduction of water quality due to wildfire, flooding, and the limited activities currently occurring; changes in populations and habitats result from natural fluctuations and increasing human population	Oil and gas exploration and leasing, timber harvest, prescribed fire, placer mining, and other allowed activities may adversely affect fisheries through loss of habitat and impacts to water quality and quantity; fishing activities may increase	Oil and gas exploration and leasing, timber harvest, prescribed fire, placer mining and other allowed activities may adversely affect fisheries through loss of habitat and impacts to water quality and quantity; fishing activities may increase	Minor impacts may result from limited reduction of water quality due to seismic activities, prescribed fire, and mining; some increase in harvest would occur with increasing human population	Minor impacts may result from limited reduction of water quality due to seismic activities, prescribed fire, and mining; some increase in harvest would occur with increasing human population
Water Quantity/ Quality	Water quantity not expected to change; negligible short-term impacts to water quality could occur locally, but overall no significant change	Major long-term impacts to water quality and quantity may occur in localized areas of the refuge where development occurs; only minor long-term impacts refuge-wide	Major long-term impacts to water quality and quantity may occur in localized areas of the refuge where development occurs; only minor long-term impacts refuge-wide	Water quantity not expected to change; negligible short-term impacts to water quality could occur locally, but no long-term change is expected	Water quantity not expected to change; negligible short-term impacts to water quality could occur locally, but no long-term change is expected
Visual/ Air Quality	Only negligible impacts to visual and air quality anticipated from current activities	Moderate long-term impacts to visual and air quality would occur in areas adjacent to oil and gas development and other activities allowed on the refuge	Moderate long-term impacts to visual and air quality would occur in areas adjacent to oil and gas development and other activities allowed on the refuge	Only negligible impacts to visual and air quality expected refuge-wide; impacts would be localized and project related	Only negligible impacts to visual and air quality expected refuge-wide; impacts would be localized and project related
Population	Small seasonal increase in transient population from oil and gas exploration activities	May be significant increase in both transient and permanent populations of communities on or near the refuge due to increasing economic development and public use	May be significant increase in both transient and permanent populations of communities on or near the refuge due to increasing economic development and public use	Negligible increase in transient population expected	Negligible increase in transient population expected
Social	Negligible impacts to traditional lifestyles	Significant impacts to traditional lifestyles could occur with increasing economic development, with increasing public use, or from potential improvement in access	Significant impacts to traditional lifestyles would result from increasing economic development on the refuge, and small increases in public use	Negligible impacts to traditional lifestyles	Negligible impacts to traditional lifestyles

Table 21. Summary of the biological and socioeconomic impacts resulting from the five alternatives, Yukon Flats Refuge (cont.).

Element Evaluated	Alternative A (Current Situation)	Alternative B	Alternative C	Alternative D (Preferred)	Alternative E
Economy	No significant change in current economic conditions	May be significant local/regional economic growth with oil and gas development, other economic uses, and increasing public use; employment opportunities would increase for local residents	May be significant local/regional economic growth with oil and gas development, and other economic uses; employment opportunities would increase for local residents	Negligible increase in local economy may result from wilderness designation and from oil and gas exploration and mining	Negligible increase in local economy may result from wilderness designation and from oil and gas exploration and mining
Recreational Use	Slight increase in recreational use primarily the result of regional population growth; increase would not be significant	Recreational use would increase mainly because of increasing economic development on the refuge, although recreational use would be encouraged; increase would not be significant	Recreational use would increase mainly because of increasinf economic development on the refuge; increase would not be significant	Slight increase in use over current levels if the White Mts. are designated as wilderness	Slight increase in use over current levels if any or all of the refuge is designated as wilderness
Cultural Resources	Only negligible impacts now occurring; monitoring of activities and mitigation of potential impacts would continue	Minor localized impacts due to oil and gas leasing, other development activities, and increasing recreational use; monitoring of activities and mitigation of potential impacts would continue	Minor localized impacts due to oil and gas leasing and other development activities; monitoring of activities and mitigation of potential impacts would continue	Negligible impacts from increasing public use, oil and gas exploration, mining, and prescribed fire; monitoring of activities and mitigation of potential impacts would continue	Negligible impacts from increasing public use, oil and gas exploration, mining, and prescribed fire; monitoring of activities and mitigation of potential impacts would continue
Subsistence	Current opportunities for participation in traditional activities by local residents would be maintained	Opportunities for participation in traditional activities would be maintained, but conflicts between users would increase; competition for resources would increase with increasing public use and potential improvement in access on and to the refuge	Opportunities for participation in traditional activlties would be maintained, but conflicts between users would increase; competition for resources would increase with increasing public use	Current opportunities for participation in traditional activities by local residents would be maintained; only negligible localized impacts anticipated	Current opportunities for participation in traditional activities by local residents would be maintained; only negligible localized impacts anticipated

Significant short-term increases in the population of Fort Yukon and other refuge communities could occur as a result of these activities occurring on the refuge. These population increases, in turn, would result in both beneficial and adverse changes in the communities. Long-term population increases would also occur on the refuge if oil and gas leasing and development were to occur.

Alternative C would have many of the same adverse impacts on social conditions in refuge communities because of the number of workers involved in oil and gas exploration, leasing, and development on the refuge. Workers associated with other development activities (primarily commercial timber harvest and placer mining), however, would be local residents. Recreational use of the refuge would not increase as much under this alternative. Long-term increases in population, though occurring, would be less significant.

Subsistence use of the refuge would be most affected, both adversely and beneficially, under Alternative B. Access opportunities would increase if road development were to occur (although no roads are planned, improved roads would be allowed on 22 percent of the refuge; unimproved and temporary roads would be allowed on an additional 46 percent of the refuge), thus making it easier for subsistence users to get to the resources. However, there is greater potential in this alternative than the others for increased competition for subsistence resources with recreational use encouraged and more non-local workers employed on the refuge. More recreational hunters may use the refuge and the number of subsistence users may increase resulting in more competition for the resources. In addition, wildlife populations could be depleted or would move to more remote areas of the refuge as development occurs. The Service would have to devote more attention to monitoring uses and to mitigating potential impacts than would be true for the other alternatives.

Subsistence use under Alternative C would also be affected, although not to the same extent as under Alternative B. Access opportunities could increase slightly as unimproved and temporary roads would be allowed on 26 percent of the refuge. Increased recreational use would occur as a result of the work force required for oil and gas exploration, leasing, and development. Competition for subsistence resources would increase, although not to the same level as anticipated in Alternative B.

Section 1317 of ANILCA directs the Service to study all non-wilderness lands in the Alaska refuges and recommend areas suitable for inclusion in the National Wilderness Preservation System. Proposals to designate additional wilderness on the refuge vary significantly between the five alternatives. Under Alternatives A, B, and C, the Service would propose no refuge lands for designation as wilderness. Eight percent of the refuge, the White-Crazy Mountains, would be proposed for designation under Alternative D. All refuge lands would be proposed for wilderness designation in Alternative E. Wilderness designation would provide long-term congressional protection to refuge fish and wildlife resources and would add a unique area to the National Wilderness Preservation System. The wilderness proposals would preclude some potential activities on the refuge. Oil and gas leasing and commercial timber harvest would not be allowed in designated wilderness areas. Commercial timber harvest activities would not be affected by the wilderness proposal in Alternative D as it is unlikely that timber harvest would ever occur in the

area of the refuge proposed for designation, but opportunities for timber harvest would be precluded under Alternative E. Under Alternative D, oil and gas leasing opportunities would be foregone in a small portion of the area identified as having moderate geologic potential for discovery of oil and gas. All opportunities for oil and gas leasing on the refuge would be foregone if all refuge lands were designated as wilderness as proposed in Alternative E. Precluding oil and gas leasing and timber harvest activities would result in the loss of some potential economic benefits to the local, state, and national economy under these alternatives. Neither of the wilderness proposals would have significant effects on prescribed burning or mining activities on the refuge. Table 22 summarizes the effects of the wilderness proposals on the significant wilderness issues.

In summary, the number of impacts and the severity of the impacts on the fish, wildlife, and people that use the Yukon Flats Refuge would be smallest in Alternatives A, D, and E. Management direction is the same in all three alternatives; only the wilderness recommendation is different. Most of the impacts that would result from these alternatives would be negligible, short-term, and localized in extent. Alternative B would result in the greatest number of impacts over the largest area. The level of development in Alternative B could result in significant long-term impacts to waterfowl populations and habitats, fish populations and habitats, water quality, and subsistence activities on the refuge. Impacts which would result from implementing Alternative C place it in the middle of the range of alternatives, with significant long-term impacts possible but confined to a smaller area of the refuge than in Alternative B. Most of the potential impacts caused by the alternatives could be mitigated by careful regulation and monitoring. With the possible exception of impacts on waterfowl and fisheries from Alternatives B and C, none of the potential impacts would result in potential decreases in fish and wildlife populations that would affect the long-term integrity of the refuge's fish and wildlife populations.

The major refuge issues and concerns were identified early on in the planning process and provided one of the bases for the development of the management alternatives. Because of the number of different types of issues raised and the diversity of groups affected by management of the refuge, no single alternative probably would satisfy all of the concerns--each of the alternatives would satisfy the concerns of some groups and cause problems for other groups. For example, Alternative E would satisfy the desire of conservation groups to maximize environmental protection, but the alternative would not satisfy the the development concerns raised by industry. The Service believes that Alternative D provides a balanced approach that optimizes benefits, satisfies most of the concerns of the affected groups, and maintains options for possible future changes in management as demands for and concerns about refuge resources change. Table 23 evaluates the alternatives based on significant planning issues.

Table 22. Summary of the effects of the alternative wilderness proposals on the significant wilderness issues, Yukon Flats Refuge.

Issue Evaluated	Alternative A (Current Situation)	Alternative B	Alternative C	Alternative D (Preferred)	Alternative E
Wilderness Values	Temporary impacts to naturalness from oil and gas exploration (short-term crushing of vegetation on no more than 1,000 acres along seismic lines and at core drilling sites, displacement of sensitive wildlife during activities, visual impacts due to on-site workers and vegetation impacts); solitude affected by noise and visual impacts from mining (less than 100 acres), recreational use (up to 25% increase), and oil and gas exploration activities (less than 1,000 acres and 50 or fewer people); negligible impacts from prescribed burns	Same impacts as under Alternative A for oil and gas exploration; oil and gas development and mining would impact naturalness, solitude, and primitive recreation (on 8,000 acres at mining sites; on 50,000 acres around each production field; on 100,000 acres along the pipeline); negligible impacts from prescribed burning and timber harvest; recreational use (up to a 100% increase) would have minor impacts on solitude and primitive recreaction in the vicinity of production fields and along major waterways	Same impacts as under Alternative A for oil and gas exploration; same impacts as under Alternative B for oil and gas development, mining, prescribed burning, and timber harvest; recreational use (up to a 50% increase) would have minor impacts on solitude and primitive recreation in the vicinity of production fields and along major waterways	Same impacts as under Alternative A for oil and gas exploration; mining would impact naturalness and solitude (on 8,000 acres around the mining site); solitude affected by noise and visual impacts from recreational use (up to a 35% increase); negligible impacts from prescribed burns	Same impacts as under Alternative A for oil and gas exploration; solitude affected by noise and visual impacts from mining (less than 100 acres); recreational use (up to a 50% increase) would have minor impacts on solitude and primitive recreation along major waterways; negligible impacts from prescribed burns
Prescribed burning on the refuge	Prescribed burning would occur on 4 sites of 10,000 to 20,000 acres each	Prescribed burning would occur on 4 sites of 10,000 to 20,000 acres each	Prescribed burning would occur on 4 sites of 10,000 to 20,000 acres each	Designating 8% of the refuge as wilderness would not affect proposed prescribed burns (4 sites of 10,000 to 20,000 acres each)	Designating all of the refuge as wilderness would not affect proposed prescribed burns (4 sites of 10,000 to 20,000 acres each)
Commercial timber harvest on the refuge	Commercial timber harvest is not currently occurring on the refuge nor would it be permitted in the future under this alternative	Lack of a wilderness proposal would not affect timber harvest on the refuge; harvest projected on 20 acres annually	Lack of a wilderness proposal would not affect timber harvest on the refuge; harvest projected on 20 acres annually	Commercial timber harvest would not be permitted on the refuge under this alternative; designating 8% of refuge as wilderness would not affect timber harvest	Commercial harvest would not be permitted on the refuge under this alternative; designating all of the refuge as wilderness would preclude projected harvest of 20 acres annually
Mineral development on the refuge	Only limited mining activities (affecting less than 10 acres in doing required assessment work) is now occurring; refuge closed to new mining claims	Lack of a wilderness proposal would have no effect on mining activities on the refuge (affecting less than 100 acres); refuge closed to new mining claims	Lack of a wilderness proposal would have no effect on mining activities on the refuge (affecting less than 100 acres); refuge closed to new mining claims	Proposing 8% of refuge for wilderness would have no effect on mining on the refuge (no claims in proposed area); refuge closed to new mining claims	Proposing all of refuge for wilderness would have negligible impacts on mining (projected to remain at present level - less than 10 acres affected); refuge closed to new mining claims
Oil and gas exploration, leasing, and development on the refuge	Oil and gas exploration can currently occur throughout the refuge (affecting no more than 1,000 acres); leasing is not permitted	Lack of a wilderness proposal would have no effect on oil and gas exploration (affecting no more than 1,000 acres) and development (projected on 500 to 1,000 acres at 2 sites and 320 acres along production pipeline)	Lack of a wilderness proposal would have no effect on oil and gas exploration (affecting no more than 1,000 acres) and development (projected on 500 to 1,000 acres at 2 sites and 320 acres along production pipeline)	Leasing would be precluded on 8% of the refuge; future leasing could occur on remainder of refuge (with plan revision); exploration could occur throughout the refuge, but would be limited in wilderness areas; projected production field development would be precluded	Leasing would be precluded throughout the refuge with wilderness designation; exploration activities would be limited in wilderness (affecting no more than 500 acres); projected production field development (500 to 1,000 acres at 2 sites and 320 acres along pipeline) would be precluded

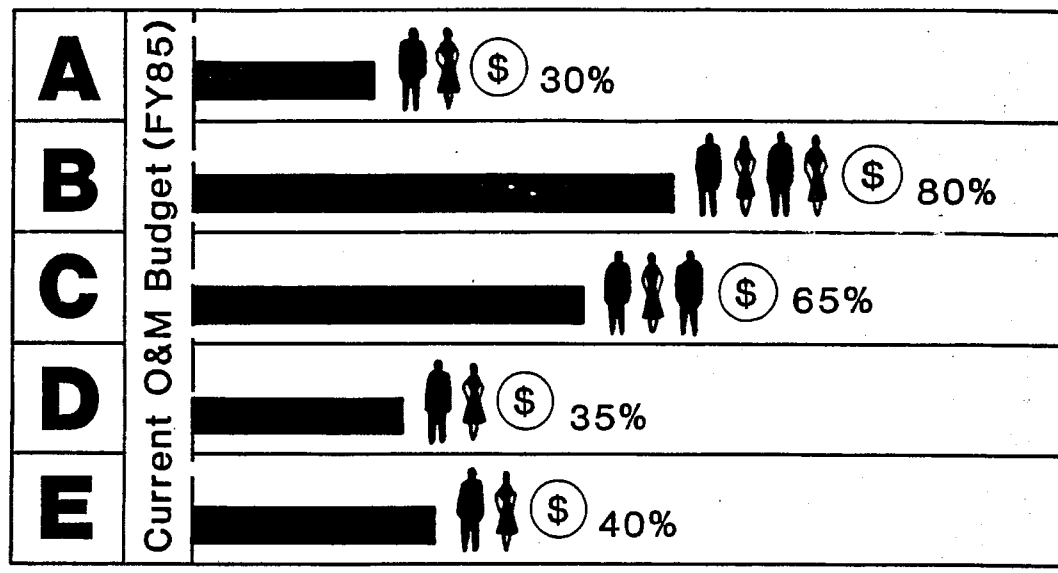
Table 23. Evaluation of alternatives based on issues.

Issue Evaluated	Alternative A (Current Situation)	Alternative B	Alternative C	Alternative D (Preferred)	Alternative E
Prescribed burning on the refuge	Prescribed burning allowed throughout refuge (four burns are proposed though none have occurred; mechanical manipulation and water impoundments and diversions not allowed	Prescribed burning allowed throughout refuge (four burns proposed); 68% of refuge open to mechanical manipulation and water impoundments and diversions though none are planned	Prescribed burning allowed throughout refuge (four burns proposed); 26% of refuge open to mechanical manipulation and water impoundments and diversions though none are planned	Prescribed burning allowed throughout refuge (four burns proposed); mechanical manipulation and water impoundments and diversions not allowed	Prescribed burning allowed throughout refuge (four burns proposed); mechanical manipulation and water impoundments and diversions not allowed
Commercial timber harvest on the refuge	Commercial timber harvest is not currently occurring and is not allowed under current management	Commercial timber harvest would be allowed on 68% of refuge; limited harvest for local use expected	Commercial timber harvest would be allowed on 26% of refuge; limited harvest for local use expected	Commercial timber harvest would not be allowed under proposed management	Commercial timber harvest would not be allowed under proposed management
Wilderness designation	None of the refuge is currently designated or proposed for designation as wilderness	None of the refuge would be proposed for designation as wilderness	None of the refuge would be proposed for designation as wilderness	White-Crazy Mts. (8% of refuge) proposed for designation as wilderness	Proposes all of the refuge for designation as wilderness
Wilderness values	Only localized negligible to minor short-term impacts to wilderness values would occur as a result of current management	Negligible to minor localized impacts, both short and long term, could affect wilderness values under proposed management	Negligible to minor localized impacts, both short and long term, could affect wilderness values under proposed management	Only localized negligible to minor short-term impacts would affect wilderness values under proposed management	Only localized negligible to minor short-term impacts would affect wilderness values under proposed management
Mineral development on the refuge	Only limited mining activities occur on refuge currently; closed to new entry (mining claims)	Mining activities could increase if any valid claims are patented; closed to new entry (mining claims)	Mining activities could increase if any valid claims are patented; closed to new entry (mining claims)	Mining activities could increase if any valid claims are patented; closed to new entry (mining claims)	Mining activities could increase if any valid claims are patented; closed to new entry (mining claims)
Oil and gas exploration, leasing, and development on the refuge	Oil and gas exploration and leasing not occurring on refuge currently; exploration could occur under current oil and gas policy; leasing could not occur without changing the plan	Exploration would be allowed throughout refuge; leasing could be allowed on 68% of refuge subject to assessmentof potential, national interest determination, and a compatibility determination	Exploration would be allowed throughout refuge; leasing could be allowed on 26% of refuge subject to assessment of potential, national interest determination, and a compatibility determination	Oil and gas exploration would be allowed throughout refuge; oil and gas leasing could not occur without changing the plan (designated wilderness would be closed to leasing)	Oil and gas exploration would be allowed throughout refuge; oil and gas leasing could not occur without changing the plan (designated wilderness would be closed to leasing)

RELATIVE COSTS OF THE ALTERNATIVES

Staffing needs and management costs are another factor to consider in evaluating the alternatives. Figure 30 compares the costs of the five alternatives. Alternative A, the current situation, would be the least costly of the five alternatives, requiring a 30 percent increase in funding and two additional staff positions to fully implement the management direction as outlined. Alternative B would be the most costly, requiring an 80 percent increase over current funding and five additional staff positions. Alternative D, the preferred alternative, would require a 35 percent increase in funding and two additional staff positions (the same as Alternative A) in order to fully implement the management directions of the alternative and provide needed support in biological, information and education, and recreational use programs.

Figure 30. Relative cost of implementing the alternatives based on operations and maintenance budget, Yukon Flat Refuge.



SELECTION OF THE PREFERRED ALTERNATIVE

The Service has selected Alternative D as its preferred alternative for managing the Yukon Flats Refuge, believing that it would satisfy the purposes of the refuge and that it provides a balanced approach to meeting the needs and concerns of the public. The Service would carefully monitor and regulate all uses and activities which would occur on the refuge to minimize potential adverse impacts to refuge resources in this alternative. Although it may not be possible to fully implement all of the management directions in this alternative at once, with current fiscal constraints, the Service would take what actions it can with available funds.

The Service will not begin to implement the management direction in the preferred alternative until affected local, state, and federal government agencies, industry, local interests, conservation groups, and other interested parties and individuals have had a chance to review and comment on the final plan. A 30-day period following the publication of the final CCP/EIS will allow for this review. A Record of Decision will then be published and implementation of the plan can start.

APPENDICES

APPENDIX A
LIST OF PREPARERS

The planning team for the draft Yukon Flats National Wildlife Refuge Comprehensive Conservation Plan/EIS bears primary responsibility for preparing the plan.

YUKON FLATS REFUGE PLANNING TEAM

Barcelona, Rich	Assistant Refuge Manager
Clark, Jim	Fire Management Officer
Evans, Mike	Public Involvement Specialist
Haase, Mike	Writer-Editor
Hawkinson, John	Fisheries Biologist
Jerry, Danielle	Wildlife Biologist
McLean, Scott	Wildlife Biologist
Olson, Norman	Team Leader/Landscape Architect
Swenson, Lou	Refuge Manager

DISCIPLINARY SPECIALISTS

Adsit, Charles	Realty Specialist
Bigsby, Phil	Physical Scientist
Diters, Chuck	Archaeologist
Duffy, Bruce	Cartographer
Emmel, Ken	Cartographer
Follows, Donald	Sociologist
Gallagher, Patti	Visual Information Specialist
Guenther, Conrad	Production Coordinator
Henderson, Jim	Computer Systems Analyst Supervisor
Knauer, Bill	EIS Coordinator
Leedy, Bob	Subsistence Specialist
Nichols, Gary	Cartographer
Patterson, Dave	Recreation Specialist
Peterson, Larry	Fisheries Biologist
Seemel, Robert	Wilderness Specialist
Slothower, Roger	Computer Systems Analyst
Talbot, Steve	Botanist
Thuma, Ron	Socioeconomist
Vandergraft, Doug	Cartographer
Williams, Wally	Chief, Land Status and Mapping
Zupanic, Gary	Cartographer

APPENDIX B
CONSULTATION AND COORDINATION

The following agencies, organizations, or individuals have received copies of this draft comprehensive conservation plan for the Yukon Flats Refuge for review and comment.

MEMBERS OF CONGRESS

Senator Frank H. Murkowski
Senator Ted Stevens
Representative Don Young

FEDERAL AGENCIES

Advisory Council on Historic Preservation
Alaska Land Use Council
Department of Agriculture
    Forest Service
    Soil Conservation Service
Department of Commerce
    National Marine Fisheries
    National Oceanic and Atmospheric Administration
Department of Defense
    U. S. Army, Corps of Engineers
Department of Energy
    Federal Energy Regulatory Commission
Department of Health and Human Services
Department of Housing and Urban Development
Department of the Interior
    Bureau of Indian Affairs
    Bureau of Land Management
    Bureau of Mines
    Geological Survey
    Minerals Management Service
    National Park Service
Department of Transportation
    U.S. Coast Guard
    Federal Aviation Administration
    Federal Highway Administration
Environmental Protection Agency

STATE AGENCIES
(through the State Conservation System Unit Planning Coordination Office)

Office of the Governor
    Office of Coastal Management
    Office of Management and Budget
Department of Commerce and Economic Development
    Alaska Power Authority
Department of Community and Regional Affairs
Department of Education
Department of Environmental Conservation
Department of Fish and Game
Department of Health and Social Services
Department of Labor
Department of Law
Department of Military Affairs
Department of Natural Resources
Department of Public Safety
    Division of Fish and Wildlife Protection
Department of Revenue
Department of Transportation and Public Facilities
Alaska State Library

LOCAL GOVERNMENT, CIVIC ORGANIZATIONS, AND LIBRARIES

Anchorage Public Libraries
Beaver Village Council
Birch Creek Village Council
Chalkyitsik Village Council
Circle Village Council
Fairbanks, City
Fairbanks North Star Borough
Fairbanks North Star Borough Libraries
Fort Yukon, City
Fort Yukon Native Village
Stevens Village Council
Venetie Village Council

NATIVE ORGANIZATIONS

Alaska Federation of Natives
Alaska Indian and Eskimo Association
Beaver Kwit'chin Corporation
Birch Creek Corporation
Chalkyitsik Native Corporation
Danzhit-Hanlaii Corporation
Dinyea Corporation
Doyon, Ltd.
Gwitchyaa Zhee Corporation
Interior Village Association
Tanana Chiefs Conference
Tihteet'Aii Corporation
Venetie Indian Corporation

OTHER ORGANIZATIONS

Alaska Alpine Club
Alaska Association of Soil Conservation Subdistricts
Alaska Center for the Environment
Alaska Coalition
Alaska Conservation Society
Alaska Miners Association
Alaska Oil and Gas Association
Alaska Pacific University
Alaska Professional Hunters Association
Alaska Sportsmen's Council
Alaska Trappers Association
Alaska Wilderness Council
Alaska Wildlife Alliance
American Fisheries Society
Anchorage Audubon Society
Arctic Environmental Information and Data Center
Atlantic Richfield Company
Chevron USA, Inc.
Center for Northern Studies
Central Property Owners Association
Circle Community Association
Cities Service Oil Company
Citizens Advisory Commission on Federal Areas
Citizens for Management of Alaska Lands
Defenders of Wildlife
Environmental Defense Fund
Exxon Company USA
Fairbanks Fish and Game Advisory Commmittee
Friends of the Earth
Greenpeace Alaska
Interior Regional Council
Interior River Users Group
International North Pacific Fisheries Commission
International Pacific Salmon Fisheries Commission
Izaak Walton League
Knik Kanoers and Kayakers
Louisiana Pacific Corporation
Marathon Oil Company
National Audubon Society
National Rifle Association
National Wildlife Federation
National Wildlife Refuge Association
Nature Conservancy
North Pacific Fishery Management Council
Northern Alaska Environmental Center
Off-Highway Sportsmans Association
Pacific Marine Fisheries Commission
Shell Oil Company
Sierra Club
Society of American Foresters
Sohio BP Alaska

Sportsmans Game Preservation Association
State Chamber of Commerce
Standard Oil of California
Tesoro Alaskan Petroleum Corporation
Texaco, Inc.
The Institute of Ecology
The Wilderness Society
Trout Unlimited Alaska
Trustees for Alaska
Union Oil Company
University of Alaska
Wildlife Society
Wildlife Management Institute
Yukon Flats Fish and Game Advisory Committee

MEDIA

Alaska Native News
Alaska Radio Network
All Alaska Weekly
Anchorage Daily News
Anchorage Times
Fairbanks Daily News Miner
KAKM TV, Anchorage
KJNP-TV and Radio, North Pole
KSKA Public FM Radio, Anchorage
KTBY-TV, Anchorage
KTTU-TV, Fairbanks
KTUU-TV, Anchorage
KTVA-TV, Anchorage
KTVF-TV, Anchorage
KUAC FM Public Radio/TV, Fairbanks
Northland News, Fairbanks
The Council
Tundra Times

APPENDIX C

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APPENDIX D
BIRDS OF YUKON FLATS NATIONAL WILDLIFE REFUGE

Birds of Yukon Flats National Wildlife Refuge are listed in the following two tables. The first table lists common and scientific names. Source of the scientific names was the American Ornithologists' Union Checklist of North American Birds (6th Edition) and the Thirty-Fifth Supplement to the A.O.U. Checklist of North American Birds (July, 1985). The second table lists the common names along with the primary habitats with which they are associated. Habitats listed are derived from the land cover classes used in the Landsat-based map of the refuge. This table is meant to show primary habitats used by the various species. Habitat relationships were derived from R. H. Armstrong, Guide to the Birds of Alaska, 1983, and A Field Guide to the Birds of North America, National Geographic Society , S. L. Scott, editor. Also listed are wintering areas where known. Information on wintering areas for waterfowl are from F. C. Bellrose, Ducks, Geese and Swans of North America, 1976, Stackpole Books.

BIRDS OF THE YUKON FLATS NATIONAL WILDLIFE REFUGE

Common Name	Scientific Name
	GAVIIFORMES
Red-throated loon	*Gavia stellata*
Pacific loon	*G. pacifica*
Common loon	*G. immer*
	PODICIPEDIFORMES
Horned grebe	*Podiceps auritus*
Red-necked grebe	*P. grisegena*
	ANSERIFORMES
Tundra swan	*Cygnus columbianus*
Trumpeter swan	*C. buccinator*
Greater white-fronted goose	*Anser albifrons*
Snow goose	*Chen caerulescens*
Brant	*Branta bernicla*
Canada goose	*B. canadensis*
Green-winged teal	*Anas crecca*
Mallard	*A. platyrhynchos*
Northern pintail	*A. acuta*
Blue-winged teal	*A. discors*
Northern shoveler	*A. clypeata*
Gadwall	*A. strepera*
American wigeon	*A. americana*
Canvasback	*Aythya valisineria*
Redhead	*A. americana*
Ring-necked duck	*A. collaris*
Greater scaup	*A. marila*
Lesser scaup	*A. affinis*

Common Name	Scientific Name
King eider	Somateria spectabilis
Harlequin	Histrionicus histrionicus
Oldsquaw	Clangula hyemalis
Black scoter	Melanitta nigra
Surf scoter	M. perspicillata
White-winged scoter	M. fusea
Common goldeneye	Bucephala clangula
Barrow's goldeneye	B. islandica
Bufflehead	B. albeola
Common merganser	Mergus merganser
Red-breasted merganser	M. serrator
	FALCONIFORMES
Osprey	Pandion haliaetus
Bald eagle	Haliacetus leucocephalus
Northern harrier	Circus cyaneus
Sharp-shinned hawk	Accipter striatus
Northern goshawk	A. gentilis
Swainson's hawk	Buteo swainsoni
Red-tailed hawk	B. jamicensis
Rough-legged hawk	B. lagopus
Golden eagle	Aquila chrysaetus
American kestrel	Falco sparverius
Merlin	F. columbarius
Peregrine falcon	F. peregrinus
Gyrfalcon	F. rusticolus
	GALLIFORMES
Spruce grouse	Dendragapus canadensis
Willow ptarmigan	Lagopus lagopus
Rock ptarmigan	L. mutus *
Ruffed grouse	Bonasa umbellus
Sharp-tailed grouse	Tympanuchus phasianellus
	GRUIFORMES
American coot	Fulica americana
Sandhill crane	Grus candensis
	CHARADRIIFORMES
Black-bellied plover	Pluvilas squatarola
Lesser goldern plover	P. dominica
Semipalamated plover	Charadrius semipalmatus
Killdeer	C. vociferus
Lesser yellowlegs	Tringa flavipes
Solitary sandpiper	T. solitaria
Wandering tattler	Heteroscelus incanus
Spotted sandpiper	Actitis macularia
Upland sandpiper	Bartramia longicauda

Common Name	Scientific Name
Whimbrel	Numenius phaeopus
Hudsonian godwit	Limosa haemastica
Surfbird	Aphriza virgata *
Sanderling	Calidris alba
Semipalmated sandpiper	C. pusilla
Western sandpiper	C. mauri
Least sandpiper	C. minutilla
Baird's sandpiper	C. bairdii
Pectoral sandpiper	C. melanotos
Dunlin	C. alpina
Long-billed dowitcher	Limnodromus scolopaceus
Common snipe	Gallinago gallinago
Red-necked phalarope	Phalaropus lobatus
Long-tailed jaeger	Stercorarius longicaudis
Bonaparte gull	Larus philadelphia
Mew gull	L. canus
Herring gull	L. argentatus
Glaucous gull	L. hyperboreus
Arctic tern	Sterna paradisaea
	COLUMBIFORMES
Mourning dove	Zenaida macroura
	STRIGIFORMES
Great horned owl	Bubo virginianus
Snowy owl	Nyctea scandiaca
Northern hawk-owl	Surnia ulula
Great gray owl	Strix nebulosa
Short-eared owl	Asio flammeus
Boreal owl	Aegolius funereus
	CORACIIFORMES
Belted kingfisher	Ceryle alcyon
	PICIFORMES
Downy woodpecker	Picoides pubescens
Hairy woodpecker	P. villosus
Three-toed woodpecker	P. tridactylus
Black-backed woodpecker	P. arctus
Common flicker	Colaptes auratus
	PASSERIFORMES
Olive-sided flycatcher	Contopus borealis
Western wood peewee	C. sordidulus *
Alder flycatcher	Empidonax alnorum
Hammond's flycatcher	E. hammondii
Say's phoebe	Sayornis saya
Horned lark	Erempohila alpestris

Common Name	Scientific Name
Tree swallow	Tachycineta bicolor
Violet-green swallow	T. thalassina
Bank swallow	Riparia riparia
Cliff swallow	Hirundo pyrrhonota
Gray jay	Perisoreus canadensis
Common raven	Corvus corax
Black-capped chickadee	Parus atricapillus
Siberian tit	P. cinctus
Boreal chickadee	P. hudsonicus
American dipper	Cinclus mexicanus
Artic warbler	Phylloscopus borealis *
Ruby-crowned kinglet	Regulus calendula
Northern wheatear	Oenanthe oenanthe
Townsend's solitaire	Myadestes townsendi
Gray-cheeked thrush	Catharus minimus
Swainson's thrush	C. ustulatus
Hermit thrush	C. guttatus
American robin	Turdus migratorius
Varied thrush	Ixoreus naevius
Yellow wagtail	Motacilla flava
Water pipit	Anthus spinoletta
Bohemian waxwing	Bombycilla garrulus
Northern shrike	Lanius excubitor
European starling	Sturnis vulgaris
Orange-crowned warbler	Vermivora celata
Yellow warbler	Dendroica petechia
Yellow-rumped warbler	D. coronata
Townsend's warbler	D. townsendi
Blackpoll warbler	D. striata
Northern waterthrush	Seiurus noveboracensis
Wilson's warbler	Wilsonia pusilla
American tree sparrow	Spizella arborea
Savannah sparrow	Passerculus sandwichensis
Dark-eyed junco	Junco hyemalis
Fox sparrow	Passerella iliaca
Lincoln's sparrow	Melospiza lincolnii
Golden-crowned sparrow	Zonotrichia atricapilla *
White-crowned sparrow	Z. leucophrys
Lapland lonspur	Calcarius lapponicus
Snow bunting	Plectrophenax nivalis
Red-winged blackbird	Agelaius phoeniceus
Rusty blackbird	Euphagas carolinus
White-winged crossbill	Loxia leucoptera
Pine grosbeak	Pinicola enucleator
Common redpoll	Carduelis flammea
Hoary redpoll	C. hornemanni

* Hypothetical

HABITATS USED BY BIRDS OF THE YUKON FLATS NATIONAL WILDLIFE REFUGE

Species	Habitats Used /Riv/	/Lak/	/Grs/	/LTu/	/ATu/	/TMS/	/CFW/	/DFW/	/MFW/	/Clf/	/Grv/	/Alp/	Primary Wintering Area
Red-throated loon	X	X											Coastal AK
Pacific loon	X	X											Coast from AK to Mexico
Common loon	X	X											SE AK and B.C.
Horned grebe		X											Coastal AK, Kodiak to Ketchikan
Red-necked grebe		X	X										SE AK
Tundra swan		X	X	X									Probably CA
Trumpeter swan	X	X	X				X						SE coastal AK, B.C.
Greater white-fronted goose	X	X	X	X									TX and N-Cen Mexico
Snow goose		X	X	X									CA
Brant		X		X									Coast WA to Mexico
Canada goose	X	X	X	X				X	X				Columbia Basin of WA and OR
Green-winged teal	X	X	X	X		X							CA, OR, and WA
Mallard		X	X	X		X	X	X	X				Coast from B. C.to WA and OR
Northern pintail	X	X	X	X		X							Pac. and Cen. flyways S to Mex.

Key to Table and Comparison to Landsat Land Cover Classes:

	Habitat	Land Cover Class		Habitat	Land Cover Class
Riv	river	clear and sedimented water	CFW	coniferous forest and woodland	open and closed needleleaf forest
Lak	ponds and lakes	clear water	DFW	deciduous forest and woodland	deciduous forest and scrub
Grs	grassy meadows	graminoid marsh	MFW	mixed forest and woodland	mixed forest
LTu	lowland tundra	not classified	Clf	cliff	not classified
ATu	alpine tundra	alpine scrub and prostrate dwarf shrub tundra	Grv	sand and gravel	lowland alluvium and mud
TMS	tall and medium scrub	closed and open deciduous scrub	Alp	alpine barren	alpine barren

Postal state abbreviations are used, as well as N,S,E,W for the cardinal directions.

Species	Habitats Used /Riv/	/Lak/	/Grs/	/LTu/	/ATu/	/TMS/	/CFW/	/DFW/	/MFW/	/Clf/	/Grv/	/Alp/	Primary Wintering Area
Blue-winged teal		X	X	X		X							CA
Northern shoveler		X	X	X		X	X	X	X				CA
Gadwall		X	X	X									
American wigeon	X	X	X	X		X	X	X	X				Pac. flyway S to CA, TX, LA
Canvasback		X	X	X		X							CA, Chesapeake Bay S to Pamlico Sound
Redhead		X	X	X		X							Gulf Coast of TX and LA
Ring-necked duck		X	X	X		X	X		X				Mississippi flyway
Greater scaup	X	X	X	X		X	X	X	X				Coast S to CA and Gulf Coast of LA
Lesser scaup	X	X	X	X		X	X	X	X				Gulf Coast from TX to FL and CA
King eider		X	X	X									Aleutian Is.
Harlequin	X				X	X	X	X	X				SE coast of AK
Oldsquaw		X		X									Coast S to Puget Sound
Black scoter	X	X											Coastal AK
Surf scoter	X	X		X		X	X		X				Coastal Ak
White-winged scoter	X	X				X	X						Coastal AK
Common goldeneye		X	X				X	X	X				S-Cen AK coast to Kodiak
Barrow's goldeneye			X					X	X	X			S-Cen AK coast to Kodiak
Bufflehead	X	X					X		X				Coast of AK and B. C.
Common merganser	X	X					X	X	X				Coast S to CA
Red-breasted merganser	X	X				X	X		X				Coastal AK S to Mexico
Osprey	X	X	X	X		X	X	X	X				Cent. CA to South America
Bald eagle	X	X	X	X		X	X	X	X				Cent. CA to South America
Northern harrier			X	X	X	X							Southern B. C. S through Mex.
Sharp-shinned hawk			X	X		X	X	X	X				Southern B. C. to Mexico
Northern goshawk			X				X	X	X				Cent. AK S to Mexico
Swainson's hawk			X	X	X	X	X	X	X	X			South America
Red-tailed hawk			X	X	X	X	X	X	X	X			Southern B. C. to Mexico
Rough-legged hawk			X	X	X	X	X	X	X	X			Southern B. C. to CA
Golden eagle			X	X	X	X	X	X	X	X			Southern Alberta and B. C. to Mex.
American kestrel			X	X	X	X	X	X	X				Southern B. C. to Central America
Merlin				X		X	X	X	X				From CA through Mexico
Peregrine falcon	X	X	X	X	X					X			Pacific coast from SE AK to Mex.
Gyrfalcon				X	X					X		X	
Spruce grouse							X		X				Resident

Species	Habitats Used /Riv/	/Lak/	/Grs/	/LTu/	/ATu/	/TMS/	/CFW/	/DFW/	/MFW/	/Clf/	/Grv/	/Alp/	Primary Wintering Area
Willow ptarmigan				X	X	X	X		X				Resident
Rock ptarmigan					X	X						X	Resident
Ruffed grouse						X		X	X				Resident
Sharp-tailed grouse			X	X		X	X		X				Resident
American coot		X											Pacific flyway into CA
Sandhill crane	X	X	X	X		X					X		Western TX, NM into n-cent. Mex.
Black-bellied plover	X	X	X	X									SW B. C. to Central America
Lesser golden plover	X	X		X	X								Southern half of South America
Semipalmated plover	X	X		X							X		CA to Central America
Killdeer	X	X	X	X							X		
Lesser yellowlegs		X		X		X	X	X	X				Mexico through South America
Solitary sandpiper		X		X			X	X	X				South America
Wandering tattler	X	X	X		X					X			Southern CA to South America
Spotted sandpiper	X	X	X	X			X	X	X				Southern B. C. to South America
Upland sandpiper			X	X	X								Southern South America
Whimbrel		X	X	X									Southern CA to South America
Hudsonian godwit		X	X	X			X						
Surfbird		X			X							X	
Sanderling		X									X		Southern B. C. to Chile
Semipalmated sandpiper		X		X							X		South America
Western sandpiper	X	X											Mexico through Central America
Least sandpiper		X	X	X									Coastal OR to South America
Baird's sandpiper		X	X	X	X								South America
Pectoral sandpiper		X	X										South America
Dunlin	X	X											S-coastal B. C. to Mexico
Long-billed dowitcher		X		X									Cent. CA to Central America
Common snipe		X	X	X		X	X		X				Southern B. C. to Central America
Red-necked phalarope	X	X		X									Pelagic off the Pacific coast of South America
Long-tailed jaeger				X	X								Pelagic off the Pacific coast of South America
Bonaparte gull	X	X					X						WA to Mexico
Mew gull	X	X		X			X	X	X		X		S-coastal AK to CA
Herring gull	X	X					X				X		B. C. to Central America

Species	Habitats Used /Riv	/Lak	/Grs	/LTu	/ATu	/TMS	/CFW	/DFW	/MFW	/Clf	/Grv	/Alp/	Primary Wintering Area
Glaucous gull	X	X					X				X		Pacific coast from Aleutians to CA
Arctic tern	X	X	X	X							X		Southern tip of South America
Mourning dove			X				X						
Great horned owl			X	X		X	X	X	X				Int. AK
Snowy owl			X	X									Arctic North America
Northern hawk-owl							X	X	X				Southern AK, Canada, northern U.S.
Great gray owl				X			X	X	X				AK to northern U.S.
Short-eared owl		X	X	X									Southern B. C. to Mexico
Boreal owl				X			X		X				
Belted kingfisher	X	X											SE AK to NW Mexico
Downy woodpecker							X	X	X				Int. AK to northern U.S.
Hairy woodpecker							X	X	X				Int. AK to northern U.S.
Three-toed woodpecker							X		X				Int. AK to northern U.S.
Black-backed woodpecker							X		X				
Common flicker						X	X	X	X				Int. AK to western U.S.
Olive-sided flycatcher							X		X				Northern South America
Western wood peewee								X	X				
Alder flycatcher						X		X	X				
Hammond's flycatcher								X	X				
Say's phoebe				X		X				X			CA
Horned lark		X	X		X								Southern B. C. into OR
Tree swallow	X	X	X	X		X		X	X				CA to Central America
Violet-green swallow	X	X	X	X		X		X	X				CA to Central America
Bank swallow	X	X	X	X						X			South America
Cliff swallow	X	X	X	X			X			X			South America
Gray jay							X	X	X				Int. AK
Common raven			X	X	X	X	X	X	X	X	X	X	Int. AK
Black-capped chickadee						X		X	X	X			Int. AK
Siberian tit				X		X	X		X	X			
Boreal chickadee						X	X		X	X			
American dipper	X												Central and southern AK
Arctic warbler			X			X							
Ruby-crowned kinglet						X		X	X				

Species	Habitats Used /Riv/	/Lak/	/Grs/	/LTu/	/ATu/	/TMS/	/CFW/	/DFW/	/MFW/	/Clf/	/Grv/	/Alp/	Primary Wintering Area
Northern wheatear					X							X	Africa
Townsend's solitaire							X		X				
Gray-cheeked thrush						X	X	X	X				Northern part of South America
Swainson's thrush						X	X		X				Southern Mex. and Central America
Hermit thrush						X	X	X	X				OR to NW Mexico
American robin			X	X	X	X	X	X	X				Gulf coast of U.S.
Varied thrush							X		X				ID to CA
Yellow wagtail				X		X							
Water pipit	X	X		X	X								OR to western Mexico
Bohemian waxwing				X			X	X	X				SE AK to CA
Northern shrike			X	X		X	X	X	X				Int. AK to northern U.S.
European starling			X				X	X	X				
Orange-crowned warbler				X		X		X	X				CA to Guatamala
Yellow warbler						X		X	X				Probably Southern Mexico
Yellow-rumped warbler						X		X	X				OR to Central America
Townsend's warbler							X		X				
Blackpoll warbler						X	X		X				OR to Central America
Northern waterthrush	X	X				X		X	X				Venezuela to Brazil
Wilson's warbler						X		X	X				Caribbean area
American tree sparrow				X		X							
Savannah sparrow			X	X		X							Southern U.S. from CA to TX
Dark-eyed junco						X	X		X				OR to NW Mexico
Fox sparrow						X	X		X				Eastern U.S.
Lincoln's sparrow			X	X		X		X	X				Gulf coast states
Golden-crowned sparrow				X	X	X	X		X				Mexico to Guatamala
White-crowned sparrow			X	X		X	X						
Lapland longspur				X	X								Southern B.C. to northern Mex.
Snow bunting				X	X							X	Southern B.C. to Central Mex.
Red-winged blackbird		X	X			X							South to NE CA
Rusty blackbird	X	X	X	X		X	X	X					N-cent. U.S.
Pine grosbeak							X	X	X				Gulf coast states
White-winged cross-bill							X		X				Int. AK to northern U.S. Central AK to MT
Common redpoll			X	X	X	X		X	X				Northern CA and NV
Hoary redpoll				X	X	X		X	X				Int. AK to Southern B. C.

APPENDIX E
MAMMALS OF THE YUKON FLATS NATIONAL WILDLIFE REFUGE

Scientific names and species order follow A. W. F. Banfield's The Mammals of Canada (1974) published for the National Museum of Natural Sciences.

Species	Scientific Name
Masked shrew	*Sorex cinereus*
Vagrant shrew	*S. vagrans*
Dusky shrew	*S. obscurus*
Arctic shrew	*S. arcticus*
Pigmy shrew	*Microsorex hoyi*
Little brown bat	*Myotis lucifugus*
Big brown bat	*Eptesicus fuscus*
Pika	*Ochotona princeps*
Snowshoe hare	*Lepus americanus*
Hoary Marmot	*Marmota caligata*
Arctic ground squirrel	*Spermophilus undulatus*
American red squirrel	*Tamiasciunus hudsonicus*
Northern flying squirrel	*Glaucomys sabrinus*
Beaver	*Castor canadensis*
Northern red-backed vole	*Clethrionomys rutilis*
Brown lemming	*Lemmus sibiricus*
Northern bog lemming	*Synaptomys borealis*
Collard lemming	*Dicrostonyxn torquatus*
Muskrat	*Ondatra zibethica*
Singing vole	*Microtus miurus*
Meadow vole	*M. pennsylvanicus*
Tundra vole	*M. oeconomus*
Long-tailed vole	*M. longicaudustion*
Chestnut-cheeked vole	*M. xanthognatus*
Meadow jumping mouse	*Zapus hudsonius*
Porcupine	*Erethizon dorsatum*
Coyote	*Canis latrans*
Wolf	*C. lupus*
Red fox	*Vulpes vulpes*
Black bear	*Ursus americanus*
Grizzly bear	*U. arctos*
Marten	*Martes americana*
Short-tailed weasel	*Mustela erminea*
Least weasel	*M. nivalis*
Mink	*M. vison*
Wolverine	*Gulo gulo*
River otter	*Lutra canadensis*
Lynx	*Felix canadensis*
Caribou	*Rangifer taranadus*
Moose	*Alces alces*
Dall sheep	*Ovis dalli*

HABITATS USED BY MAMMALS OF YUKON FLATS NATIONAL WILDLIFE REFUGE

Habitat relationships are derived from Burt and Grossenheider, 1976; Ingles, 1965; Banfield, 1974; Maser, et al., 1981

Species	Habitats Used												
	Riv	Lak	Grs	LTu	ATu	TMS	CFW	DFW	MFW	Clf	Grv	Alp	
Dusky shrew				X	X		X		X				
Masked shrew						X	X	X	X	X			
Arctic shrew					X	X	X						
Pigmy shrew				X	X		X	X	X	X			
Little brown bat	X	X	X	X			X	X	X	X			
Snowshoe hare				X	X		X	X	X	X			
Pika						X							X
Arctic ground squirrel					X							X	
Red squirrel								X		X			
Northern flying squirrel													
Beaver	X	X					X		X	X			
Hoary marmot					X	X							X
Northern bog lemming				X	X	X		X					
Brown lemming						X	X						
Collard lemming					X	X	X	X	X	X			
Red-backed vole				X	X	X	X	X	X	X			
Meadow vole				X	X				X	X	X		
Long-tailed vole				X	X	X	X	X	X	X			
Chestnut-cheeked vole								X	X	X			
Root vole					X	X							
Singing vole				X	X	X							
Meadow jumping mouse				X	X								
Muskrat	X	X		X									
Porcupine								X	X	X			
Black bear	X	X		X	X		X	X	X	X			
Grizzly bear	X	X		X		X	X		X	X			X
Marten							X	X	X	X			
Short-tailed weasel					X		X	X	X	X			
Least weasel				X	X		X	X	X	X			
Mink	X	X											
Wolverine						X		X	X	X			
River otter	X	X											
Red fox				X	X		X						
Coyote				X	X	X	X	X	X	X			
Wolf				X	X	X	X	X	X	X			X
Lynx				X	X	X	X	X	X	X			
Moose	X	X		X	X		X	X	X	X			
Caribou				X	X	X	X	X		X			
Dall sheep			X		X	X							X

APPENDIX F
FISHERIES RESOURCES

The following information provides additional detail relative to the fisheries management program on the Yukon Flats Refuge and to the use of fish by local residents and for commercial purposes.

FISH OF THE YUKON FLATS NATIONAL WILDLIFE REFUGE AREA

Common Name	Scientific Name	Fresh Water Lakes	Rivers	Streams	Wetlands
	PETROMYZONTIDAE				
Arctic lamprey	*Lampetra japonica*	H	H	H	N
	SALMONIDAE				
Coho salmon	*Oncorhynchus kisutch*	R	H	H	N
Chinook salmon	*O. tshawytscha*	R	H	H	N
Chum salmon	*O. keta*	R	H	H	N
Dolly varden char	*Salvelinus malma*	N	R	H	N
Arctic grayling	*Thymallus arcticus*	H	H	H	N
Broad whitefish	*Coregonus nasus*	H	H	I	N
Humpback whitefish	*C. pidschian*	H	H	I	N
Least cisco	*C. sardinella*	H	H	I	N
Bering cisco	*C. laurettae*	N	H	I	N
Round whitefish	*Prosopium cylindraceum*	H	H	H	N
Sheefish	*Stenodus leucichthys*	R	H	I	N
	UMBRIDAE				
Alaska blackfish	*Dallia pectoralis*	H	H	I	I
	CATOSTOMIDAE				
Longnose sucker	*Catostomus catostomus*	H	H	H	I
	GADIDAE				
Burbot	*Lota lota*	H	H	H	N
	COTTIDAE				
Slimy sculpin	*Cottus cognatus*	H	H	H	N
	CYPRINIDAE				
Lake chub	*Couesius plumbeus*	H	H	N	N

H = High Use I = Intermediate Use R = Rare Use N = Unknown Use

Ongoing and Planned Studies for the Yukon Flats Refuge.

Fisheries and Aquatic Habitat Survey of the Hodzana River. The Alaska National Interest Lands Conservation Act (ANILCA) provided for mineral exploration on lands within the refuge. As authorized under ANILCA, the regional corporation (Doyon, Ltd.) may select up to 23,040 acres within the area known as the "Hodzana Study Area" for mineral development. Little information is available on the aquatic resources of the area. The objectives of the study are to provide current data on the aquatic resources and habitat, and to develop a model or models to characterize and quantify stream fish habitat on the Yukon Flats Refuge.

Aerial Stream Surveys of the Yukon Flats Refuge. A three-year study to identify andromous fish spawning streams, identify migration routes, enumerate escapement, and identify fish stocks will be initiated on refuge streams in 1985. Several of the streams of the 12 major watersheds combined with the Yukon and Porcupine rivers have been identified as important migration routes. Only two streams, the Chandalar and the Sheenjek rivers, have been identified as major spawning areas. Budget constraints and weather conditions limit the amount of aerial survey time the State of Alaska is able to provide. There is an urgent need to locate and protect spawning areas and migration routes to insure continued subsistence use of this important natural resource.

Lake Studies. By 1990 (funding permitting), 125 lakes, several of them located on the Yukon Flats Refuge, will be studied to develop qualitative models of fish populations, fish habitat suitablility indicies, a map base lake fisheries classification system, and to provide limnological information for ongoing waterfowl studies.

Subsistence and Commercial Use of Salmon

Use of salmon by residents of villages within or near the Yukon Flats Refuge is important to the subsistence way of life in which most of the local residents participate. Tables F-1 and F-2 provide data on the chinook and chum salmon subsistence harvests by residents of several of the communities on the refuge.

The commercial harvest of salmon is also important on the Yukon River. The Yukon Flats Refuge is within District 5. Commercial fishing activities on the refuge are limited because of the nature of the stream channel through the refuge--meandering and braided with multiple channels. Table F-3 provides data on commercial salmon harvest in District 5, though most of this harvest occurs outside the boundaries of the refuge.

Table F-1. Chinook salmon subsistence catch by village. Source: ADF&G, 1984c.

Village	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Stevens Village	362	643*	1252*	3178	2194*	3962*	2387*	3745*	5203*	4676*
Beaver	168	188	299	558	394	506	552	250	220	553
Fort Yukon	215	1158	1061	2642	1922	2527	2794	1894	1887	3608
Circle	16	528	304	212	1175	769	728	969	648	545
Canyon Village	-	-	-	-	-	-	-	-	-	-
Chalkyitsik	-	-	-	-	-	-	-	-	-	-

- symbol means that no information was available

* Includes catches made by Fairbanks permit holders who fished near the Yukon River bridge.

Table F-2. Chum salmon subsistence catch by village. Source: ADF&G, 1984c.

Village	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Stevens Village	2297	1170*	4926*	16460	12413*	11685*	23061*	19429*	23690*	28268*
Beaver	1270	517	716	1717	1826	458	881	2412	6104	167
Fort Yukon	19458	1143	13630	21580	22266	7828	24632	3485	11120	10590
Circle	1283	153	203	859	3541	1785	7828	290	3762	3107
Canyon Village	-	-	-	-	-	-	-	-	-	-
Chalkyitsik	-	-	600	-	-	-	-	-	-	-

- symbol means that no information was available

* Includes catches made by Fairbanks permit holders who fished near the Yukon River bridge.

Table F-3. Commercial salmon harvest by species, District 5 (includes Statistical Areas 334-51, 334-52, 334-53, 334-54). Source: ADF&G, 1984c.

Year	Chinook*	Chum*	Coho	Total
1974	2,663	30,382	1,409	34,454
1975	2,872	40,209	5	43,086
1976	3,151	6,161	0	9,312
1977	4,162	27,004	2	31,168
1978	3,079	25,908	1	28,988
1979	3,389	56,067	0	59,456
1980	4,891	42,227	0	47,118
1981	6,374	87,856	0	94,230
1982	5,385	13,827	0	19,212
1983	3,606	44,035	0	47,641
1984	3,669	24,705	1,095	29,469

* Includes "equivalent numbers" of salmon converted from roe sales.

APPENDIX G
INTERNATIONAL TREATIES

A number of international treaties affect how the Fish and Wildlife Service manages the Yukon Flats National Wildlife Refuge. The following table identifies the major treaties and the primary purposes of these treaties.

Treaty	Purpose
Convention between the Government of the United States of America and the Government of Japan for the Protection of Migratory Birds and Birds in Danger of Extinction, and Their Environment	To provide for the protection of species of birds which are common to both countries, or which migrate between them, by (1) enhancement of habitat, (2) exchange of research data, and (3) regulation of hunting.
Convention between the United States and Great Britain (for Canada) for the Protection of Migratory Birds	Adopted a uniform system of protection for certain species of birds which migrate between the United States and Canada, to assure the preservation of species either harmless or beneficial to man. Sets certain dates for closed seasons on migratory birds. Prohibits hunting insectivorous birds, but allows killing birds under permit when injurious to agriculture. Canada and the United States signed an agreement on January 30, 1979, to amend the treaty to allow subsistence hunting of waterfowl outside of the normal hunting season.
Convention between the United birds States of America and the Union of Soviet Socialist Republics Concerning the Conservation of Migratory Birds and Their Environment	Provides for the protection of species of that migrate between the United States and the Soviet Union or that occur in either country and "have common flyways, breeding, wintering, feeding or moulting areas." Encourages actions to identify and protect important habitat and to cooperate in protection of migratory birds identified as being in danger of extinction.
Treaty between the United States and Great Britain or Relating to Boundary Waters between the United States and Canada	To prevent disputes regarding the use of boundary waters and settle all questions pending that may arise in the future between the United States and Canada involving the rights, obligations, and interests of both nations along their common frontier.
Treaty of Washington between the United States and Great Britain (dated May 8, 1871)	Guarantees the navigational use of the Yukon and Porcupine rivers by Canada. Includes protection of the free passage of fish which spawn in Canada.

Treaty	Purpose
Convention between the United States and the United Mexican States for the Protection of Migratory Birds and Game Mammals	Adopted a system for protecting certain migratory birds in the United States and Mexico. Allows, under regulation, the rational use of certain migratory birds. Provides for enactment of laws and regulations to protect birds by establishment of closed seasons and refuge zones. Prohibits killing of insectivorous birds, except under permit when harmful to agriculture. Provides for enactment of regulations on transportation of game mammals across the United States-Mexican border.
Pacific Salmon Treaty	Establishes six fishery management regions, as well as a Pacific Salmon Commission charged with managing the Pacific salmon fishery on the west coast of the U.S. Major provisions of the treaty include joint management of the Pacific salmon stocks and a reduction in catch of certain stocks off Southeastern Alaska and British Columbia. It also provides for U.S.-Canadian negotiations on Yukon River stocks of Pacific salmon.
Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere (United States and 17 other American Republics)	To "protect and preserve in their natural habitat representatives of all species and genera of their native flora and fauna, including migratory birds" and to protect regions and natural objects of scientific value. The nations agreed to take certain actions to achieve these objectives, including the adoption of "appropriate measures for the protection of migratory birds of economic or esthetic value or to prevent the threatened extinction of any given species."
Agreement on Cooperation in the Field of Environmental Protection (United States and the Union of Soviet Socialist Republics)	To cooperate in the field of environmental protection through exchange of scientific personnel, organization of bilateral conferences, exchange of scientific and technical information, and development and implementation of projects. Emphasizes activities related to air and water pollution, enhancement of urban environments, preservation of nature, establishment of preserves, and arctic and subarctic ecological systems.

APPENDIX H

MASTER MEMORANDUM OF UNDERSTANDING
BETWEEN
THE ALASKA DEPARTMENT OF FISH AND GAME
Juneau, Alaska
AND
THE U.S. FISH AND WILDLIFE SERVICE
DEPARTMENT OF THE INTERIOR
Anchorage, Alaska

This Master Memorandum of Understanding between the State of Alaska, Department of Fish and Game, hereinafter referred to as the Department, and the U.S. Fish and Wildlife Service, hereinafter referred to as the Service, reflects the general policy guidelines within which the two agencies agree to operate.

WHEREAS, the Department, under the Constitution, laws and regulations of the State of Alaska (Appendix I), is responsible for the management, protection , maintenance, enhancement, rehabilitation, and extension of the fish and wildlife resources of the State on the sustained yield principle, subject to preferences among beneficial uses; and

WHEREAS, the Service, by authority of the Constitution, laws of Congress and regulations of the U.S. Department of Interior (Appendix II) has a mandated management responsibility for certain species or classes of wildlife and is responsible for the management of Service lands in Alaska, and the conservation of fish and wildlife resources on these lands; and

WHEREAS, the Department and the Service share a mutual concern for fish and wildlife resources and their habitats and both are engaged in extensive fish and wildlife conservation, management, and protection programs and desire to develop and maintain a cooperative relationship which will be in the best interests of both parties, the concerned fish and wildlife resources and their habitats, and produce the greatest public benefit; and

WHEREAS, it has been recognized in the Alaska National Interest Lands Conservation Act and subsequent implementing Federal regulations that the resources and use of Service lands in Alaska are substantially different than those of other states; and

WHEREAS, the Department and the Service recognize the increasing need to coordinate resource planning and policy development;

NOW, THEREFORE, the parties hereto do hereby agree as follows:

THE DEPARTMENT OF FISH AND GAME AGREES:

1. To recognize the Service as the agency with the responsibility to manage migratory birds, endangered species, and other species mandated by Federal law, and on Service lands in Alaska to conserve fish and wildlife and their habitats and regulate human use.

2. To manage fish and resident wildlife populations in their natural species diversity on Service lands.

3. To consult with the Regional Director in a timely manner and comply with applicable Federal laws and regulations before embarking on enhancement or construction activities on Service lands.

THE FISH AND WILDLIFE SERVICE AGREES:

1. To recognize the Department as the agency with the primary responsibility to manage fish and resident wildlife within the State of Alaska.

2. To recognize the right of the Department to enter onto Service lands at any time to conduct routine management activities which do not involve construction, disturbance to the land, or alterations of ecosystems.

3. To cooperate with the Department in planning for enhancement or development activities on Service lands which require permits, environmental assessments, compatibility assessments, or similar regulatory documents by responding to the Department in a timely manner with requirements, time tables, and any other necessary input.

4. To manage the fish and wildlife habitat on Service lands so as to insure conservation of fish and wildlife populations and their habitats in their natural diversity.

5. To consider carefully the impact of any proposed treaties or international agreements relating to fish and wildlife resources on the State of Alaska which could diminish the jurisdictional authority of the State and to consult freely with the State when these treaties or agreements have a primary impact on the State.

6. To review present U.S. Fish and Wildlife Service policies and any future proposed changes in those policies in consultation with the Department to determine if modified or special policies are needed for Alaska.

7. To adopt refuge management plans whose provisions--including provision for animal damage control--are in substantial agreement with the Department's fish and wildlife management plans, unless such plans are determined formally to be incompatible with the purposes for which the respective refuges were established.

8. To utilize the State's regulatory process to maximum extent allowed by Federal law in developing new or modifying existing Federal regulations or proposing changes in existing State regulations governing or affecting the taking of fish and wildlife on Service lands in Alaska.

THE DEPARTMENT OF FISH AND GAME AND THE FISH AND WILDLIFE SERVICE MUTUALLY AGREE:

1. To coordinate planning for management of fish and wildlife resources on Service lands so that conflicts arising from differing legal mandates, objectives, and policies either do not arise or are minimized.

2. To consult with each other when developing policy and legislation which affects the attainment of wildlife resource management goals and objectives, or management plans.

3. To recognize that the taking of fish and wildlife by hunting, trapping, or fishing on Service lands in Alaska is authorized in accordance with applicable State and Federal law unless State regulations are found to be incompatible with documented Refuge goals, objectives, or management plans.

4. To develop such supplemental memoranda of understanding between the Commissioner and the Regional Director as may be required to implement the policies contained herein.

5. That this Master Memorandum of Understanding shall become effective when signed by the Commissioner of the Alaska Department of Fish and Game and the Alaska Regional Director of the U.S. Fish and Wildlife Service and shall continue in force until terminated by either party by providing notice in writing 120 days in advance of the intended date of termination.

6. That amendments to this Master Memorandum of Understanding may be proposed by either party and shall become effective upon approval by both parties.

STATE OF ALASKA Department of Fish and Game	U.S. DEPARTMENT OF THE INTERIOR Fish and Wildlife Service
Ronald O. Skoog Commissioner	Keith M. Schreiner Regional Director, Alaska
March 13, 1982 Date	March 13, 1982 Date

APPENDIX I

Memorandum of Understanding
Between
The United States Department of Interior
And
The United States Department of Agriculture
And
The State of Alaska
Governing
The Conduct of Uplands Mineral
Leasing, and Lands Disposal on Lands
Outside the North Slope of Alaska
May 24, 1982

I. Preamble

This agreement is made in order to promote more rational land-use planning in Alaska respecting 1) exploration for and development of oil and gas resources in areas of Alaska outside the North Slope, and 2) the disposal of State or Federal lands to private parties in Alaska. The parties to this agreement recognize the proliferation of programs in these regards and are desirous of 1) optimizing the resource values of these programs, while 2) minimizing the administrative, environmental, and social costs associated therewith. The parties agree that these goals may be best accomplished by mutual cooperation as set forth herein.

The principles described in the Alaska National Interest Lands Conservation Act, Sections 1008 and 1201(j), and the Alaska Cooperative Policy Statement which provide for consultation and cooperative management shall guide the implementation of this agreement. The consultative and cooperative management procedures established shall take due account of the need for consistency between Federal plans, policies and actions and similar plans, policies and actions of the State, whether such consistency is mandated by law or indicated as a matter of sound public policy.

The statutory authorities for the parties to enter into this agreement are as follows:

1. Bureau of Land Management: 43 USC 1737
2. Fish and Wildlife Service: 16 USC 3101
3. Minerals Management Service: 16 USC 3101
4. Forest Service: 16 USC 3101
5. Department of Natural Resources: AS 38.05.020 (b)(2)
6. Department of Fish and Game: AS 16.05.020 (3)
7. Department of Environmental Conservation: AS 46.030.020 (8)

Further, the Parties, as members of the Alaska Land Use Council, reaffirm their commitment to the principles set forth in the Land Use Council Resolution C.R. 001/81/4 of February 9, 1982, which resolution resulted i the completion of this Agreement, and which reads as follows:

Whereas, there are several State and Federal government programs, either now operating or proposed, respecting oil and gas leasing on uplands in Alaska, other mineral leasing and disposal of lands; and

Whereas, it is in the best interests of the State and Federal governments to maximize the positive values of such programs while simultaneously minimizing adverse social, economic and environmental impacts associated therewith; and

Whereas, the State and Federal government agencies charged with development and management of these programs are represented on the Alaska Land Use Council; and

Whereas, these agencies recognize that the public interest in these programs is best served by effective inter-agency coordination;

Now, therefore be it resolved that the Alaska Land Use Council endorses the development of a Memorandum of Agreement between the State of Alaska and the United States Department of Interior and Department of Agriculture, which memorandum would govern State and Federal inter-agency coordination respecting:

1. Federal upland oil and gas leasing under terms of Section 1008 of the Alaska National Interest Lands Conservation Act (ANILCA); and
2. Other Federal upland mineral leasing activities outside the North Slope (as defined by Section 1008 of ANILCA) under terms of the Mineral Leasing Act of 1920; and
3. State of Alaska upland oil and gas leasing outside the North Slope (as defined by Section 1008 of ANILCA); and
4. Lands actions under terms of the Federal Land Policy and Management Act (FLPMA) and settlement entry under terms of settlement laws not repealed by FLPMA, and openings of land under terms of the general mining laws, and in compliance with the Alaska Cooperative Policy Statement of March 12, 1981; and
5. Lands disposal programs conducted by the State of Alaska; and

Further be it resolved that The Memorandum of Agreement should address:

1. The needs of the State of Alaska and the Federal government to have appropriate and timely input into their respective planning and management processes regarding those programs; and
2. The need for coordination scheduling of studies, and actual leasing activities or other openings under these programs; and
3. The development of uniform standards applicable to the respective agency permitting processes regarding conduct of geophysical activities; and
4. The development of a standard methodology for collection, analysis, and use of subsistence land use data in the respective agency planning processes and funding provisions therefore; and

5. The need for better integration of State and Federal data respecting upland oil and gas and other leasable minerals, and the availability of such information to the land management agencies charged with planning these programs; and

6. The need to jointly assess the demand for lands for settlement and the most appropriate means of properly satisfying such demand under the respective State and Federal government programs available.

Be it further resolved that the Memorandum of Agreement should take the form of a general or covering document with such details appendices as may be required, provided that, in order to expedite certain processes now underway, such appendices may, in themselves, form specific agreements between the State of Alaska and any of the individual Federal government agencies and should be developed and executed as soon as possible, in any case, however, the general or covering document shall be completed and signed within 30 days of the date of passage of this resolution.

II. Scope of Agreement

A. Lands encompassed by this agreement shall include:

1. With respect to the Federal Government, those lands described in Section 1008(a) of ANILCA, namely,

   "...the Federal lands of Alaska not subject to the study required by Section 1001 of this act, other than lands included in the National Petroleum Reserve-Alaska. Such programs shall not be undertaken by the Secretary on those lands where applicable law prohibits such leasing or on those units of the National Wildlife Refuge System where the Secretary determines...that the exploration for and development of oil and gas would be incompatible with the purpose for which such unit was established.";

2. With respect to the State, all lands from time to time included in the five-year program for oil and gas leasing under AS 38.05.180 (b) and programs for disposal of surface lands under AS 38.04.020 (a).

B. Programs encompassed by this agreement shall include:

1. All Federal uplands mineral leasing programs outside the North Slope, as such area is defined in Section 1008 of ANILCA;

2. The State of Alaska's upland oil and gas leasing program outside the North Slope, as such area is defined in Section 1008 of ANILCA;

3. The settlement entry and other land disposal programs of the Bureau of Land Management, conducted under the Federal Lands Policy and Management Act, including the settlement laws extension provided for in Section 703(a)8 of that Act;

4. The State of Alaska surface lands disposal program;

5. Authorizing actions related to exploration, development, and production in Federal and State mineral leasing programs;

6. The analysis or planning programs and processes applicable to the foregoing programs.

III. General Provisions

A. Oversight

1. The parties shall ensure the proper implementation of the Agreement through the development of an implementation plan by August, 1982. Insofar as practicable, implementation shall be accomplished in a manner that requires no additional administrative actions or delays. The implementation plan will provide for the following:

a. A coordinated schedule for analysis of lands, and for the leasing and/or disposal of any such lands, described in II.A;

b. A compatible format for presentation of land use data, and maps;

c. Surface protection criteria and stipulations for surface disturbing activities arising from programs set out in II.B, which shall be standardized to the extent practicable given regional differences in terrain types and ecosystems;

d. A coordinated process for inter-agency review and comment on authorizing documents issued by the Parties with respect to activities governed by this Agreement;

e. Assurance of proper involvement of non-member agencies in the various aspects of implementation of this Agreement;

f. Such other matters as the Parties shall designate.

2. The implementation of this Agreement shall be the responsibility of the Heads of the Federal agencies in Alaska, and the Office of the Governor and the Commissioners of the State departments cited below, or their designees:

a. the Bureau of Land Management (BLM);
b. the Fish and Wildlife Service (FWS);
c. the Forest Service (FS);
d. the Minerals Management Service (MMS);
e. the Department of Natural Resources (DNR);
f. the Department of Fish and Game (DF&G);
g. the Department of Environmental Conservation (DEC);
h. the Department of Transportation and Public Facilities (DOTPF).

B. Exploration, Development, and Production Activities

The Parties recognize that exploration, development, and production activities authorized by member agencies for degrees of environmental impacts, and that there now exist techniques which can effectively minimize or eliminate potential damages. The Parties also recognize that any measures adopted in this regard should be clear, and to the

degree permissible under existing law, uniform regardless of surface management jurisdiction. Therefore, the Parties agree that:

1. Authorizing documents shall include provision to minimize, and, to the extent practicable, eliminate adverse impacts on fish and wildlife populations, subsistence and other human harvest activities, and the land surface. These provisions shall include the surface protection criteria and stipulations mutually formulated pursuant to III.A.1.c., and such other surface protection criteria and stipulations as may be indicated by the findings of agency land use plans, environmental assessments or statements, and special studies or analyses,

2. Applications for various authorizing documents shall be referred for review and comment to the Parties under procedures to be mutually determined under Section III.A.1.d.

3. Specific procedures to implement the interim management provisions of Section 906 (k) and (o) of ANILCA shall be addressed in III.A.1.d.

C. Exchange of Geological Information

The Minerals Management Service and Department of Natural Resources agree to establish procedures to share oil and gas related data and information to the fullest extent practicable, subject to proprietary and confidentiality laws, regualtions, and policies of both agencies.

D. Subsistence

The Parties recognize the specific requirements and the general intent of Title VIII of ANILCA regarding the protection of subsistence, and in particular the requirement of Section 810 of ANILCA. Accordingly, the Parites agree to mutually identify appropriate methodologies and research designs for the collection, analysis, and presentation of subsistence land use data and for the inclusion of such data in resource agency land use decisions in conformance with Section 810 of ANILCA.

IV. Program Planning Provisions

The following described planning processes shall be the methods employed by the respective agencies in analysis of land use under the programs governed by this Agreement:

A. The BLM will employ the Study Area Analysis Process (SAAP), which incorporates elements of the NEPA process and land use planning principles of Section 202, FLPMA in accordance with the supplemental agreement appended hereto.

B. The Fish and Wildlife Service will employ the Comprehensive Conservation Plans for each refuge in Alaska as required in Section 304(g) of ANILCA including a State and public involvement program required by that Act and other Federal law. Upon agreement with the State, documents describing such process will be appended hereto.

C. The Forest Service will employ the land management planning process as required by the National Forest Management Act of 1976 (PL 92-500) and regulations thereto, including a State and public involvement program as required by that Act, regulations and other Federal law. Upon agreement with the State, documents describing such process will be appended hereto.

D. The State will use the Resource Plans/Resource Inventory program to develop resource plans for State lands. For oil and gas leasing the State will employ the Major Project Review/Socio-economic and Environmental Analysis (SEAA) process. For State lands disposal for settlement, the State will use the Lands Availability Determination System (LADS) process in conjunction with the resource planning program.

We intend this Memorandum of Understanding to be the start of a continuing process in which the Departments of Interior and Agriculture along with the State of Alaska will work cooperatively to promote more rational land-use planning in Alaska respecting 1)exploration and/or development of oil and gas resources in areas of Alaska outside the North Slope, and 2) the disposal of State or Federal lands to private parties in Alaska. The Parties agree that these goals may be best accomplished by mutual cooperation as set forth herein.

Signed and dated the Twenty-fourth day of May, Nineteen Hundred Eighty-two in Anchorage, Alaska.

STATE OF ALASKA

Jay S. Hammond
Governor

Date

U.S. DEPARTMENT OF
THE INTERIOR

Donald P. Hodel
Under Secrtary

Date

U.S. DEPARTMENT OF
AGRICULTURE, FOREST SERVICE

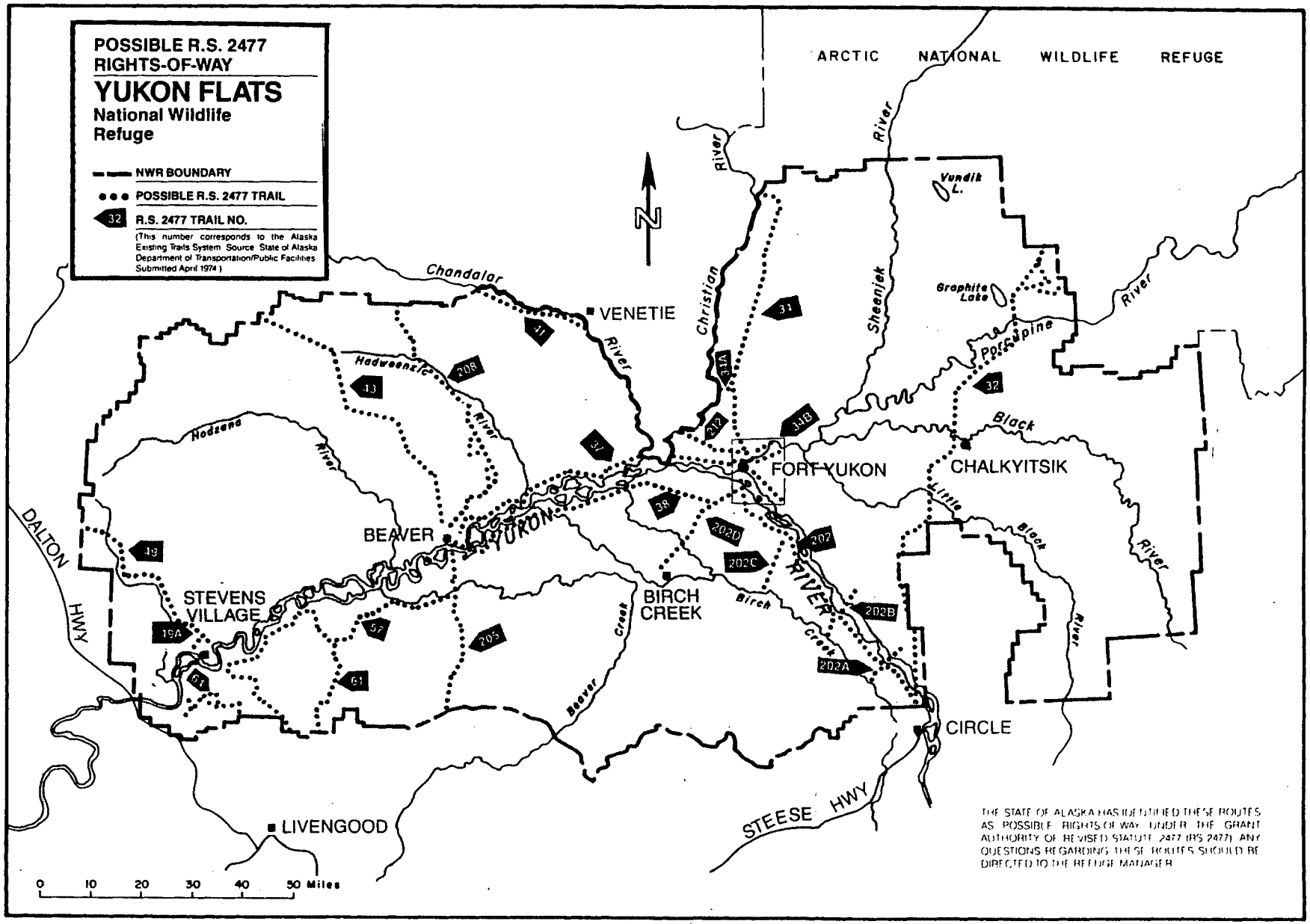
John A. Sandor
Regional Forester

Date

APPENDIX J
POTENTIAL STATE OF ALASKA REVISED STATUTE (RS) 2477 RIGHTS-OF-WAY

The State of Alaska, under Revised Statute (RS) 2477, was granted the right to identify rights-of-way over public lands, not otherwise reserved for public use, for the purpose of constructing highways. The state has identified a number of such possible transportation rights-of-way that have been historically used on refuge lands. If, in the future, these rights-of-way are determined to be valid in a court of competent jurisdiction, they could be developed as transportation corridors by the state. Following is a list and map of the trails which the state as identify (to date) as potential RS 2477 rights-of-way.

Trail Number	Description
32	Northeast access through Chalkyitsik to Yukon Border
34	Fort Yukon to Christian
34A	Alexander's Village to Veh-Tenjerlow Lakes
34B	Extending easterly from Fort Yukon
37	Trail from Fort Yukon along the Yukon River to Beaver
38	Trail from spur 202D of Trail 202 to Beaver
41	Coldfoot to Venetie
43	Beaver to Horse Creek
49	Winter trail - Bettles Field to Stevens Village
49A	Spur from Trail 49 to landing
57	Ross Creek and Jackson Lake to Beaver
61	Connecting Trails 49 and 57
64	Livengood to Fort Hamlin
202	Circle to Fort Yukon
202A	Trail from Twenty-two Mile Village to Birch Creek
202B	Trail from Halfway Whirlpool to Birch Creek
202C	Trail from Birch Creek to cabin south of Trail 202
202D	Spur of Trail 202 traveling southwest to Birch Creek
205	Chatanika - Yukon Trail (approx. 100 miles)
208	Yukon - Chandalar Sled Road (approx. 75 miles)
212	Fort Yukon - Cabins Cutoff


POSSIBLE R.S. 2477 RIGHTS-OF-WAY
YUKON FLATS
National Wildlife Refuge
NWR BOUNDARY
POSSIBLE R.S. 2477 TRAIL
32 R.S. 2477 TRAIL NO.
(This number corresponds to the Alaska Existing Trails System Source State of Alaska Department of Transportation/Public Facilities Submitted April 1974)
ARCTIC NATIONAL WILDLIFE REFUGE
N
VENETIE
FORT YUKON
CHALKYITSIK
BEAVER
STEVENS VILLAGE
BIRCH CREEK
CIRCLE
LIVENGOOD
YUKON RIVER
Chandalar
Christian River
Sheenjek River
Porcupine River
Black River
Little Black River
Hadweenzic River
Hodzana River
Birch Creek
Beaver Creek
Vundik L.
Graphite Lake
DALTON HWY
STEESE HWY
0 10 20 30 40 50 Miles
THE STATE OF ALASKA HAS IDENTIFIED THESE ROUTES AS POSSIBLE RIGHTS OF WAY UNDER THE GRANT AUTHORITY OF REVISED STATUTE 2477 (RS 2477). ANY QUESTIONS REGARDING THESE ROUTES SHOULD BE DIRECTED TO THE REFUGE MANAGER.

APPENDIX K
COMMENTS ON THE DRAFT YUKON FLATS REFUGE COMPREHENSIVE CONSERVATION PLAN/ENVIRONMENTAL IMPACT STATEMENT AND FISH AND WILDLIFE SERVICE RESPONSES

The Service received 58 letters commenting on the draft plan during the comment period. These letters are printed below, with Service responses to selected comments. In addition, 11 people presented oral testimony at two hearings on the draft plan. Testimony requiring Service response has been excerpted from the hearing transcripts and is printed at the end of this appendix along with the Service responses. The comments on the draft document were considered in preparing the final plan.

CORRESPONDENCE RECEIVED

Federal Agencies

- Advisory Council on Historic Preservation ✓
- Department of the Army
  - U.S. Army Engineer District, Alaska ✓
- Department of the Interior
  - Bureau of Indian Affairs, Juneau Area Office ✓
  - Bureau of Mines, Alaska Field Operations Center ✓
  - National Park Service, Air Quality Division ✓
- Department of Transportation
  - Federal Aviation Administration ✓
- U.S. Environmental Protection Agency, Region 10 ✓

State of Alaska

- Office of the Governor ✓

Regional, Local, and Native Organizations

- Doyon, Limited ✓
- Tanana Chiefs Conference ✓
- Dinyee ✓
- Birch Creek Village Council ✓

Organizations

- Alaska Miners Association, Inc. ✓
- Alaska Oil and Gas Association ✓
- Alaska Outdoor Council, Inc. ✓
- Alaska Waterfowl Association ✓
- Foundation of Biologic Research ✓
- National Audubon Society ✓
- National Rifle Association of America ✓
- Northern Alaska Environmental Center ✓
- Sierra Club ✓
- Sierra Club Legal Defense Fund, Inc. ✓
- The Wilderness Society ✓

Individuals/Industry

- ARCO Alaska, Inc. ✓
- Suzann Bush ✓
- Daniel L. Callahan

Individuals/Industry

Richard A Caulfield
Chevron U.S.A. Inc.
D.J. Coolidge
Helen M. Drury
Kenneth Emmel
Exxon Company, U.S.A.
Douglas J. Fruge
Richard J. Gordon
Denise Hanson/Don Soileau
Mrs. Kathryn (Billie) Hicks
Mrs. Leon Hicks
Norman Johnson
William J. Journey
James G. King
Judy Larquier
Marianne Mills
Philip Moran
Deborah Niedermeyer
Dennis Ronsse
Lee M. Schmidt
Pam and Chris Scranton
Shell Western E & P Inc.
Van Shipp
Ken Shrewsbury
Roselynn Ressa Smith
John R. Swanson
Curtis L. Terrall
Texaco Inc.
Ms. Ethel W. Thorniley
Judi Thurmond
Unocal Oil and Gas Division
Jan N. Williams

ORAL TESTIMONY

Fairbanks Hearing

Charles Vogel
Byron Haley
Gene George
Roger Kaye
Mike Matz, Northern Alaska Environmental Center
Dave Lacey, Dinyee
Oscar Frank

Anchorage Hearing

Suzanne DePaul, Exxon Company, U.S.A.
Rich Ogar, ARCO Alaska, Inc.
Susan Alexander, Alaska Regional Director for The Wilderness Society
Jack Hession, Sierra Club

Advisory Council On Historic Preservation

The Old Post Office Building
1100 Pennsylvania Avenue, NW, #809
Washington, DC 20004

Reply to: 730 Simms Street, Room 450
Golden, Colorado 80401

January 14, 1986

Mr. Robert E. Gilmore
Regional Director
Alaska Region
U. S. Fish and Wildlife Service
1011 East Tudor Road
Anchorage, AK 99503

REF: Supplement to the Comprehensive Conservation Plan for Yukon Flats National Wildlife Refuge

Dear Mr. Gilmore:

1 We have received and reviewed the referenced document. We note that oil and gas exploration and development on refuge lands may cause adverse effects on historic and archeological resources and that under Alternative C, such activities may occur on 26% of the refuge. In this light, procedures for addressing potential impacts on cultural resources and for achieving compliance with Section 106 of the National Historic Preservation Act should be incorporated into the planning process at the earliest possible date. We recommend that the U.S. Fish and Wildlife Service (FWS) initiate formal consultations with the Council promptly in order to assure that historic and archeological values are accorded adequate protection.

Section 800.8 of the Council's regulations authorizes execution of a Programmatic Memorandum of Agreement to fulfill the angency's Section 106 compliance responsibilities for a particular program or class of undertakings that would otherwise require numerous individual requests for Council comment. It appears that oil and gas exploration and development on National Wildlife Refuges in Alaska constitute such a program or class of undertakings. In this case, we recommend that you initiate formal compliance procedures by requesting the Council's assistance in developing a Programmatic Agreement. At your request, we will begin consultations concerning the provisions to be contained in such an Agreement.

If you find this approach not to be suitable, we encourage you to begin consultations with the Council and the State Historic Preservation Officer pursuant to Section 106 compliance on a case-by-case basis at the earliest opportunity.

We look forward to hearing from you. If you have any questions, or if we can provide anything further at this time, please contact Dean Shinn at 776-2682 (FTS).

Sincerely,

Robert Fink
Chief, Western Division
of Project Review

Response to Advisory Council on Historic Preservation.

1. Comprehensive Conservation Plans are very broad general management plans that provide philosophical and strategic guidance to future more specific resource management plans and federal undertakings or activities that may, at some point in the future, impact historic or cultural resources as defined by the Historic Preservation Act.

   Due to the size, complexities, and resource diversities of National Wildlife Refuge lands in Alaska, the Service does not believe the programmatic agreement approach necessary or desirable. The Service will, as required by law, address each federal activity or undertaking that may impact historic or cultural resources, thus meeting the Service responsibilities under Sections 110 and 106 of the National Historic Preservation Act.

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, ALASKA
P.O. BOX 898
ANCHORAGE, ALASKA 99506-0898

December 5, 1985

REPLY TO ATTENTION OF:

Environmental Resources Section

Mr. Robert E. Gilmore
Regional Director
U.S. Fish and Wildlife Service
1011 East Tudor Road
Anchorage, Alaska 99503

Dear Mr. Gilmore:

The U.S. Army Engineer District, Alaska, has reviewed the Draft Comprehensive Conservation Plan/Environmental Impact Statement for the Yukon Flats National Wildlife Refuge, Alaska. We have no comment.

Thank you for the opportunity to review and comment on this document. If I can be of further assistance, please do not hesitate to contact me directly. If further details are desired by your staff, contact can be made with Ms. Lizette Boyer of my Environmental Resources Section at 753-2637.

Sincerely,

Claude V. Vining
Acting Chief, Engineering Division

UNITED STATES GOVERNMENT

memorandum

BUREAU OF INDIAN AFFAIRS
JUNEAU AREA OFFICE

DATE: February 10, 1986

REPLY TO ATTN OF: Area Director, Juneau Area

SUBJECT: Yukon Flats Wildlife Refuge Comprehensive Conservation Plan, DEIS

TO: U.S. Fish and Wildlife Service, Region 7, Anchorage

The Bureau of Indian Affairs (BIA) has reviewed the subject DEIS and supplement, and would like to offer the following comments.

The organization and content of the document were excellent. The range of environment consequences appeared to be objective and thorough. The Bureau would like to encourage the Fish and Wildlife (FWS) to work with Native inholders to minimize trespass problems as discussed on page 19. The BIA has a significant trust responsibility with the 448 Native allotments located within the refuge.

1 The identification of unresolved RS 2477 rights-of-ways (ROW) could create unnecessary trespass problems. By identifying these ROW's on maps, the public may be misled, if not encouraged to use them thereby increasing potentials for conflict. This problem can be minimized by not showing them on maps for general use by the public until they are resolved.

Since the use of ORV/ATV's did not surface as a significant issue, the provisions for access to inholdings on page 153 appear to be unnecessarily restrictive. Section 1110(b) ANILCA provides that the "private owner or occupier shall be given by the Secretary such rights as may be necessary to assure adequate and feasible access for economic and other purposes to the concerned land". New modes of access that are not shown to have been traditionally employed should be allowed for access to Native allotments and for subsistence activities. We recognize that in certain situations, ORV's could cause unacceptable environmental damage and restrictions would be necessary. A less restrictive approach to ORV use would be more consistent with the minimal management strategy implied with the preferred alternative.

2 The table of relative costs for implementing the alternatives on page 125 should be more meaningful if actual costs for managing the refuge were included. It would seem that the public should know what the actual costs are to the taxpayer for refuge managment and how these would differ by alternative.

The DEIS is one of the better NEPA planning documents for the Alaska Region that we have recently reviewed.

Thank you for the opportunity to comment.

Jake Lestenkof

312

Response to Bureau of Indian Affairs.

1. We recognize your concerns relative to potential trespass problems resulting from the identification of potential RS 2477 rights-of-way on a map in the plan. However, the Regional Office has been instructed by the Department of the Interior to include a map in the appendices (Appendix K) of each plan depicting the potential RS 2477 rights-of-way within the boundaries of the given refuge.

2. Table 23 depicts the relative cost of implementing the alternatives based on the current operations and maintenance budget for the refuge. The significance of this table is the relationship of the alternatives to one another not the depiction of actual costs of implementing each alternative. Because the plan is a document presenting general management philosophies for the refuge rather than specific management directions, developing actual costs would be difficult and unrealistic.

Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

OPTIONAL FORM NO. 10
(REV. 7-76)
GSA FPMR (41 CFR) 101-11.6
5010-112

United States Department of the Interior

BUREAU OF MINES

Alaska Field Operations Center
P.O. Box 550
Juneau, Alaska 99802

October 28, 1985

Regional Director
U.S. Fish & Wildlife Service
Attn: Bill Knauer
1011 E. Tudor Rd.
Anchorage, Alaska 99503

Dear Sir,

The U.S. Bureau of Mines has reviewed the Draft Comprehensive Conservation Plan/Environmental Impact Statement and Wilderness Review for the Yukon Flats National Wildlife Refuge, and we would like to respond with the following information and comments concerning your discussion of the regional geology and mineral occurrences within the refuge.

Before we begin we would like to commend your efforts on this report. Your discussion concerning the aforementioned topics is very complete and the geologic map provided is very informative (although it should be referenced).

Of the ten quadrangles that contain parcels of land within the refuge boundaries, the following are void of mineral locations: Chandalar, Charley River, Christian, Coleen, Black River and Bettles. We are not forwarding any information on these quadrangles, but we are enclosing MILS and KARDEX map overlays and printouts for the remaining quadrangles that do contain mineral locations within the refuge boundaries (Beaver, Circle, Fort Yukon and Livengood). MILS data comes from our computer data files in which information is stored for every known mineral occurrence and deposit in the State. The KARDEX maps show the locations of most mining claims registered in the State before 1981.

1 The Beaver quadrangle contains three MILS and seven KARDEX locations within the refuge, however, our information shows the most recent activity year for any of these locations was 1982. This situation does not pose any current land use conflicts.

Three KARDEX mineral locations occur within the Fort Yukon quadrangle. Portage Creek, map #2, a placer gold operation containing 13 claims was worked in 1984 and is still valid. The other two mineral locations have been inactive for many years. Any potential land use conflict that this situation presents needs to be resolved.

1 The Livengood quadrangle contains two MILS and two KARDEX locations that lie within refuge boundaries. These are checked appropriately on the enclosed printouts. Mt. Schwatka is a silver, tin, and lead prospect (MILS map #'s 4 & 5) that you discuss on page 38. Our records show that the latest activity at Mt. Schwatka was in 1980. The two KARDEX locations have been inactive since 1980 and do not pose a current conflict with intended refuge purposes.

The Circle quadrangle contains four MILS and four KARDEX locations within the refuge boundaries. Of the MILS locations, only Raven Placer (map #13) was worked in 1984. Preacher Creek and Rock Creek, both mentioned in the metallic mineral discussion on page 38, were worked in 1984 and 1983, respectively. Preacher Creek is still an active claim although it's not located within the refuge boundaries; Rock Creek is not an active location although it is situated within the refuge. These two claims should not pose any current land use conflicts. All four of the KARDEX locations were inactive in 1984 and present no current user conflicts.

We have enclosed a xeroxed copy of "Mineral Terranes of Alaska; 1982," for the lands included within Yukon Flats NWR. The large central area denoted by the letters SCB represents a coal-oil/gas basin and map #26 corresponds with the Mudbank coal occurrence that you write about on page 39. Map #27 refers to Mt. Schwatka, a topic already covered. The mineral terrane map reveals above average mineral potential that warrants future assessment. As your management plan allows for this assessment, we have no problems with the treatment given to this topic in your report.

Sincerely,

Donald P. Blasko

Donald P. Blasko
Chief

Enclosures:

Response to Bureau of Mines.

1. We appreciate the additional information you have provided. Where appropriate, this information has been incorporated into the final plan. We have incorporated recent data on mining claims on the refuge (as of May 20, 1987) which was provided by the Bureau of Land Management.

United States Department of the Interior

BUREAU OF MINES

Alaska Field Operations Center
201 E. 9th Avenue
Suite 101
Anchorage, Alaska 99501

December 23, 1985

Regional Director
U.S. Fish & Wildlife Service
Attn: Bill Knauer
1011 E. Tudor Road
Anchorage, Alaska 99503

Dear Sir:

The U.S. Bureau of Mines has reviewed the supplement to the draft Comprehensive Conservation Plan/Environmental Impact Statement (CCP/EIS) and Wilderness Review for the Yukon Flats National Wildlife Refuge (NWR). We have no additional information to provide you with as we previously responded to the original draft CCP/EIS.

Thank you for the opportunity to comment and we offer you our continued support for this project.

Sincerely,

Donald P. Blasko

Donald P. Blasko
Chief, Alaska Field Operations Center

DPB/av

Enclosure

United States Department of the Interior

NATIONAL PARK SERVICE
AIR QUALITY DIVISION
P. O. BOX 25287
DENVER, CO 80225

IN REPLY REFER TO:
December 20, 1985

N3615(475)

Memorandum

To: Regional Director, Fish and Wildlife Service, Region Seven
ATTN: Bill Knauer

From: Chief, Air Quality Division

Subject: Supplement to the Draft Yukon Flats National Wildlife Refuge (NWR) Comprehensive Conservation Plan (CCP), Environmental Impact Statement (EIS), and Wilderness Review

The Air Quality Division (AQD) has reviewed the supplement to the draft Yukon Flats NWR CCP EIS. The supplement discusses changes to the draft CCP required by the restatement of Fish and Wildlife Service (FWS) policy on oil and gas exploration and leasing on Alaska refuges. We are concerned about the impact of possible oil and gas exploration and leasing on nearby National Park Service (NPS) units.

Gates of the Arctic National Park and Preserve is approximately 40 miles northwest of the NWR, and Yukon Charley National Preserve is approximately 40 miles southeast of the NWR. These units are both designated as class II "floor" areas under the 1977 Amendments to the Clean Air Act, which means they can only be redesignated by the State of Alaska to class I for greater protection of their resources from air pollution impacts.

1 Under the Secretary of the Interior's "park protection" initiatives, bureaus within the Department are to consult with the NPS regarding activities which could have adverse impacts on National Park resources and cooperate with the NPS on devising methods to minimize or eliminate those impacts. If it is determined to be in the national interest to allow oil and gas exploration and leasing on the Yukon Flats NWR, the AQD would like to confer with the FWS Regional Office regarding the development of stipulations and other requirements for necessary air pollution control technology or methods to minimize air pollution impacts on the nearby NPS units.

We appreciate the opportunity to review the Yukon Flats NWR CCP EIS. If you have any questions regarding our comments, or would like additional information, please contact Erik Hauge of my Division at FTS 776-8761.

John P. Christiano

Response to the National Park Service.

1. Should activities be permitted on the refuge which could potentially have adverse impacts on National Park resources, the Fish and Wildlife Service would take the appropriate actions relative to the Secretary of the Interior's "park protection" initiatives, including consultation with the Air Quality Division or other divisions of the National Park Service if necessary.

U.S. Department of Transportation
Federal Aviation Administration

Alaskan Region

701 C Street, Box 14
Anchorage, Alaska
99513

NOV - 5 1985

Mr. Robert E. Gilmore
Regional Director
U.S. Fish and Wildlife Service
1011 East Tudor Road
Anchorage, AK 99503

Dear Mr. Gilmore:

We have reviewed the draft Comprehensive Conservation Plan/Environmental Impact Statement and Wilderness Review for the Yukon Flats National Wildlife Refuge, Alaska, and have no comments.

Thank you for the opportunity to review this document.

Sincerely,

Franklin L. Cunningham
Director, Alaskan Region

Edward Warren First American Aloft

U.S. Department of Transportation
Federal Aviation Administration

Alaskan Region
(907) 271-5285

701 C Street, Box 14
Anchorage, Alaska
99513

FEB - 7 1986

U.S. Fish and Wildlife Service
Region 7
1011 East Tudor Road
Anchorage, Alaska 99503

Re: Review of Supplement to the Draft Comprehensive Conservation Plan, Environmental Impact Statement, and Wilderness Review; YUKON FLATS NATIONAL WILDLIFE REFUGE

Dear Sir:

Thank you for providing the Federal Aviation Administration with the opportunity to review the referenced draft. Please be advised that we have no comments or objections.

Sincerely,

Franklin L. Cunningham
Director

50 Years of Air Traffic Control Excellence
— A Standard for the World

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 SIXTH AVENUE
SEATTLE, WASHINGTON 98101

FEB 10 1986

REPLY TO ATTN OF: M/S 443

William W. Knauer
Office of the Regional Director
U.S. Fish and Wildlife Service
Region 7
1011 East Tudor Road
Anchorage, Alaska 99503

Dear Mr. Knauer:

The Environmental Protection Agency (EPA) has reviewed the supplemented Draft Environmental Impact Statement (DEIS) and Comprehensive Conservation Plan for the Yukon Flats National Wildlife Refuge, Alaska. The supplemented DEIS evaluates alternative schemes for management of the refuge's 8.5 million acres of public land. The alternatives reflect the recent restatement of Fish and Wildlife Service policy regarding oil and gas leasing on national wildlife refuges in Alaska. Our review has been conducted in accordance with the National Environmental Policy Act, and our responsibility under Section 309 of the Clean Air Act to determine whether the impacts of proposed federal actions are acceptable in terms of environmental quality, public health, and welfare.

Alternative D (the Fish and Wildlife Service preferred alternative) would provide reasonable protection for refuge resources and values while allowing oil and gas exploration (including seismic activities) throughout the refuge. No oil and gas leasing would be permitted. Alternative E is similar in allowing exploration, but would provide maximum protection to refuge species and habitats and retain the wilderness suitability of all refuge lands.

Alternative E is the environmentally preferred alternative; Alternative D is environmentally acceptable providing that adequate mitigation of any adverse impacts occurs. Potential water quality and wetlands impacts would be of particular concern; consideration of the adequacy of mitigation would include an evaluation of the ability to meet approved water quality standards, and a commitment that activities would be in accordance with the wetland mitigation policies of the Fish and Wildlife Service and EPA, Region 10.

In contrast, Alternatives B and C could lead to serious adverse impacts, including:

- significant restrictions to subsistence uses;
- significant long-term water quality degradation; and
- significant adverse effects on wetlands and associated fish and wildlife species.

We cannot support implementation of either Alternative B or Alternative C as described. The analysis to date suggests that significant impacts would be unavoidable. Therefore, a thorough analysis of the ability to mitigate for these adverse impacts would have to be undertaken before either of these alternatives might be considered acceptable. We can support implementation of Alternative D or E, however. Neither would preclude oil and gas exploration, yet each would avoid the potential adverse impacts listed above.

1 We believe that a preliminary determination of the compatibility of oil and gas leasing with refuge purposes would have been appropriate to include in the DEIS. Such a determination should certainly be published with the Final EIS so that the public may make reasoned judgments concerning the alternatives. The Final EIS should note that if, after the Record of Decision is published, a determination is made that oil and gas leasing is incompatible with refuge purposes, yet may be in the national interest, subsequent Plan revision would be via a DEIS that would be available for public review and comment.

We have rated the Yukon Flats DEIS and Comprehensive Conservation Plan as EO-2 (Environmental Objections - Insufficient Information). A summary of the EPA rating system for draft EISs is enclosed for your reference. This rating is based primarily on the seriousness of the concerns we have outlined regarding Alternatives B and C; those concerns would be largely ameliorated by selection of Alternative D or E.

Thank you for the opportunity to review the DEIS. If you have any questions, please contact Brian Ross of our EIS & Energy Section at (206) 442-8516 or FTS 399-8516.

Sincerely,

Robert S. Burd
Director, Water Division

Enclosure

Response to EPA.

1. Potential impacts resulting from oil and gas leasing and development are identified in the Environmental Consequences chapter under those alternatives where such activities could occur (Alternatives B and C). Under Alternative D, the Service's preferred alternative (proposed action), all refuge lands would be placed in the minimal management category. Oil and gas leasing and development are not allowed on the refuge at this time under the minimal management category. Therefore, the Service has not included an incompatibility determination for oil and gas leasing and development in the final plan.

   Should future actions require revisions of the plan to identify areas of the refuge for inclusion in the intensive or moderate management categories - where oil and gas leasing and development could be allowed, an incompatibility determination would then be made. Such revisions to the plan would be done following NEPA guidelines for public involvement in the environmental analysis process. Either new or supplemental environmental impact statements, both draft and final, would be prepared and made available for public review prior to a decision being made on the revised plan.

BILL SHEFFIELD, GOVERNOR

OFFICE OF THE GOVERNOR

OFFICE OF MANAGEMENT AND BUDGET
DIVISION OF GOVERNMENTAL COORDINATION

STATE CSU COORDINATOR
2600 DENALI STREET, SUITE 700
ANCHORAGE, ALASKA 99503-2798
PHONE: (907) 274-3528

February 26, 1986

Mr. Robert Gilmore
Regional Director
U.S. Fish and Wildlife Service
1011 East Tudor Road
Anchorage, AK 99503

Dear Mr. ~~Gilmore~~ Bob:

The State of Alaska has reviewed the draft Yukon Flats National Wildlife Refuge (NWR) Comprehensive Conservation Plan/Environmental Impact Statement/Wilderness Review (CCP). This letter is submitted on behalf of State agencies and represents a consolidation of department concerns and comments. The State has generally concluded that no individual management alternative is entirely acceptable as written, therefore our comments focus on general issues, rather than an analysis of each of the alternatives. Our comments address fish and wildlife management, transportation and access, economic development, navigability, management of watercolumns, water rights, and land protection planning.

FISH AND WILDLIFE MANAGEMENT

Provisions for maintenance and improvement of fish and wildlife populations should be incorporated regardless of which alternative is selected. This is consistent with one of the refuge's key purposes: "to conserve fish and wildlife populations and habitats in their natural diversity" as directed in the Alaska National Interest Lands Conservation Act (ANILCA). We believe it is essential that both the Fish and Wildlife Service (FWS) and the Alaska Department of Fish and Game (ADF&G) be able to conduct any necessary, desirable, biologically sound, and mutually acceptable method of maintenance or improvement in order to ensure the conservation of the populations. These include not only those activities currently contained and permitted in Table 12 of the plan, but additional methods which appear to be prohibited. We believe it is premature to preclude so many potential management options until more information is available through studies and population assessments. This concern is particularly appropriate when considering the large

data gaps that exist and that are correspondingly presented as significant problems on pages 19 and 20 of the plan.

1 Another major concern is the lack of clarity in descriptions of the management alternatives. The language is often vague or seems to conflict with statements in other sections of the plan. These contradictions cloud the intent of both the plan as a whole and the individual management strategies. This renders assessment of the alternatives difficult. As a consequence, some discussions appear to conflict with our understanding of general FWS policies regarding our abilities to cooperatively assess and manage the fisheries and wildlife resources and their habitat.

Throughout the plan we believe a greater effort should be made to stress cooperative planning, research, and management efforts between the FWS and the ADF&G. Although this is mentioned on page 123 it should be emphasized and reiterated as appropriate in other portions of the plan. Instead, we find inconsistent acknowledgement of the closely interrelated roles, rendering an impression that the FWS is exercising its oversight authority unnecessarily. We are certain that this is not FWS' intent but request assurance to that effect by incorporation of improved cooperative language throughout the plan.

2 Another major concern is the the failure to fully identify and describe significant problems "which may adversely affect the populations . . . of fish and wildlife." Such identification and description is required by ANILCA Section 304(g)(2)(E). In particular we request that the CCP identify needed public cooperation and education in adhering to resource harvest regulations on the refuge. The problem is mentioned on page 23 under the heading Difficulties in Managing the Refuge by stating that " . . . unauthorized activities may be occurring . . ."; however, the severity of the problem may be underestimated. As the respective staffs of ADF&G and the FWS increase their efforts in the refuge area, we suspect that violations of harvest regulations may be more apparent than previously indicated. We suggest that the FWS clarify that such harvests may be a significant limiting factor of big game populations in the Yukon Flats NWR. A commitment to improved enforcement, education, and achieving local support in order to reduce and eventually prevent such harvest should be described. We request that the significance of illegal harvest in preventing attainment of population goals be more clearly evident throughout the CCP, including discussion of programs to resolve the problem.

3 In cooperative efforts between ADF&G and FWS during preparation of this CCP, fisheries and wildlife management information was provided. ADF&G has additional information to correct errors, clarify misconceptions, and add omitted pertinent data. We suggest that much of this be accomplished through informal transmittal of information via the ADF&G/FWS liaison, and further request that the information be corrected in the final CCP so that the most accurate and current fisheries and wildlife information is distributed.

Resource Management Activities

4 The CCP (Pages 114, 117, and 118) currently dictates that permanent fish hatcheries, physical fish habitat manipulation, and mechanical wildlife habitat manipulation are not permitted under one or more of the land management categories. We believe that these are valid management activities which should not be precluded during this stage of management planning. Therefore we recommend that these activities be allowed where currently proposed to be prohibited. It may be appropriate to include a provision that these activities would be permitted on a case-by-case basis, following a cooperative FWS and ADF&G determination of their acceptability.

An example of why these prohibitions are of particular concern is as follows: mechanical manipulation is a tool included in the current interagency fire management plan for the region. The CCP does not permit mechanical manipulation under the moderate or minimal land management categories of the CCP. The latter category comprises 100 percent of the refuge under the preferred alternative, involving over 8 million acres. This appears to nullify the substantial efforts of the interagency fire team to prepare a plan compatible with the land classifications, resource needs, and desire to return the area to a natural habitat mosaic. We believe the two plans should be compatible and that mechanical manipulation should be permitted on the refuge when cooperatively determined necessary by respective agencies such as the FWS and the ADF&G.

Unclear Management Intent

5 The first sentence of the last paragraph on page 126 states that "Under all alternatives wildlife populations in the Yukon Flats Refuge will be maintained at or above current levels, allowing for natural fluctuations in populations to occur." We request clarification of what is meant in terms of management application by the term "natural fluctuations." Also the management directions for Alternatives A, C, D, and E emphasize: "Use management of fishing, hunting, and trapping as the primary method to maintain or increase fish and wildlife populations." (emphasis added) We are concerned that this may indicate that population management methods such as predator reductions or habitat improvement projects may not be allowed. In contrast, Table 12, which lists compatible management policies, includes activities such as removal of predators as a permissible technique. FWS' intent is further confused by the discussions on pages 117 and 118 which include prohibitions of certain management activities such as physical fish habitat manipulation and mechanical wildlife habitat manipulations. Then on page 222, the FWS/ADF&G Master Memorandum of Understanding (MOU) notes that enhancement and construction activities on FWS lands may be permissible on a case-by-case basis. We request that the understandings contained in the MOU be reflected consistently throughout the management alternatives.

ACCESS AND TRANSPORTATION

We recommend that FWS make several changes to the portions of the plan that address transportation and access. These proposed additions are to help clarify the issues of traditional access, RS 2477 rights-of-way and 17(b) easements. We recognize that the CCP has already incorporated some of our suggestions, however the plan as currently written still contains some ambiguity on these issues. Most of the information requested below addresses concerns which we have with all of the ANILCA plans for the national park and wildlife refuge systems in Alaska. The general comments below are addressed more specifically in the page-specific comments beginning on page 10 of this letter. The State's concerns that access and transportation are not dealt with adequately in the CCP would be addressed if the following changes were made and the CCP reorganized as recommended.

General Organization of Access Issues

6 The sections on access and transportation in the Affected Environment chapter should include a more detailed summary of the existing roads, trails, airstrips, and waterways used currently or historically for transportation in the refuge, including a brief discussion about the historical use, current use, and management status of each. The information in this section should include, but not be limited to 17(b) easements and RS 2477 rights-of-way as noted in our page-specific comments. The Management Alternatives chapter should also address 17(b) easements, RS 2477 rights-of-way and non-exclusive use easements.

If the FWS cannot at this time explain in detail how it intends to address each RS 2477 rights-of-way and 17(b) easement, the plan should refer to a land protection plan that FWS will develop upon completion of the CCP. This discussion in the CCP should state in general how 17(b) easements and RS 2477 rights-of-way will be addressed in the land protection plan. The discussion should also indicate that the State and other interested parties will be involved in the development of this plan.

ANCSA 17(b) Easements

7 More specifically, the Affected Environment discussion of 17(b) easements reserved pursuant to Section 17(b) of the Alaska Native Claims Settlement Act (ANCSA) should include a description of the easement types and uses for which each easement was designated. A list of all ANCSA 17(b) easements within the refuge boundary or on adjacent lands that terminate at the refuge boundary should also be included. A complete list and additional information about these easements may be obtained from the Bureau of Land Management (BLM) or an affected ANCSA corporation. We also suggest referencing the section of the plan which will be addressing management of these easements.

7 The section on 17(b) easements in the Management Alternatives chapter should reference the list of easements in the Affected Environment chapter of the plan, as described above. It should then indicate the FWS management intent for these easements. The discussion as currently written on page 134 needs to be more specific. The plan should also explain what modifications to the terms of conveyance, if any, FWS intends to propose for these easements. By law, proper notice is required before any modifications to the terms are made. If no modifications are intended, the plan should state that policy for refuge management will not affect 17(b) easements, and that all uses that are authorized in the conveyance document are allowed. If FWS does not at this time know the policy it intends to follow, then the CCP needs to explain in detail what the issues are that the policy will address and how the public will be involved in developing that policy.

RS 2477 Rights-of-Way

8 The discussion of Revised Statute (RS) 2477 in the Affected Environment chapter should briefly describe the nature of these rights-of-way and include a list of possible RS 2477 rights-of-way in the NWR. Available information regarding the current and historical use and the management status of each should be described. The section should also include a reference to the section of the plan where FWS addresses RS 2477 management concerns. The Management Alternatives chapter should similarly reference the rights-of-way listed under Affected Environment and address management intent.

Because it is important that the FWS recognize that valid RS 2477 rights-of-way may exist within national wildlife refuges, the State has suggested in the past that the CCPs include maps of possible RS 2477 rights-of-way (ROWs). Since our recommendation last summer, it has become clear that private landowners are concerned that the depiction of possible RS 2477 ROWs in the CCPs may lead to unauthorized use of adjacent private land or inholdings. Furthermore, since the CCPs acknowledge that the units are subject to valid existing rights, including RS 2477 ROWs, and the State has provided information to FWS concerning possible routes, including their location, the State believes that it is no longer necessary to include such maps in the plans. Rather, the State recommends that these maps be kept on file in FWS offices and be available for public review. Additionally, the State recommends that each CCP include a statement that additional RS 2477 ROW information is available from the FWS regional office or the State of Alaska.

Even though we feel it is no longer necessary to include maps of possible RS 2477 ROWs in the CCPs, we reiterate our request that all CCPs continue to acknowledge valid existing rights.

8 Therefore, we request that the language on page 134 be replaced with the following:

> RS 2477 (formally codified as 43 U.S.C. 932; enacted in 1866) provides that: "The rights-of-way for the construction of highways over public lands, not reserved for public uses, is hereby granted." The act was repealed by P.L. 94-579 as of October 21, 1976, subject to valid existing claims.
>
> The Yukon Flats National Wildlife Refuge is subject to valid existing rights, including rights-of-way established under RS 2477. The validity of these rights-of-way will be determined on a case-by-case basis. The following list identifies rights-of-way that the State contends may be valid under RS 2477:
>
> (List of potential RS 2477 ROWs)
>
> A map of these possible RS 2477 rights-of-way has been provided by the State and is on file at the refuge managers office and the regional office. This list and map are not necessarily all inclusive. Private parties or the State of Alaska may identify and seek recognition of additional RS 2477 rights-of-way within the Yukon Flats National Wildlife Refuge. Supporting material regarding potential rights-of-way identified by the State may be obtained through the Alaska Department of Transportation and Public Facilities, or the Alaska Department of Natural Resources.
>
> Identification of potential rights-of-way on the list and map does not establish the validity of these RS 2477 rights-of-way and does not necessarily provide the public the right to travel over them.

Unless a cooperative management agreement between the State and FWS is developed, it is inappropriate to require that users of any rights-of-way must comply with FWS permit requirements.

ECONOMIC DEVELOPMENT AND OIL AND GAS

FWS' preferred alternative should consider the high level of unemployment and need for economic development in the Yukon Flats area. This region has one of the highest unemployment rates in the State. Activities which help create jobs (such as timber harvesting, oil and gas exploration, and minerals assessment) should not be precluded. Emphasizing site-specific consideration of a range of activities subject to refuge compatibility, which is provided by the Intensive Management category, is preferable to widespread limitations of economic activity.

Existing transportation and utility corridors need to be maintained for existing and future uses. Even though power development is not permitted within the refuge, it may be

9 desirable to develop nearby resources and to use utility corridors through the refuge.

Pages 6 and 8 of the Supplemental EIS address limited road access to oil and gas development sites. As noted in Table 11, (pages 114-115) transmission lines are permitted within the refuge in intensive and moderate management areas. If developed, it is likely transmission lines would be built in conjunction with an existing road system. Depending on actual project location and economic feasibility, consideration should be given to the likelihood of interconnecting oil and gas development sites with existing transmission lines outside the refuge. If likely, the issues of road size and clearing impacts need to be addressed.

10 Page 25 of the Supplement refers to roads interconnecting villages in Alternative B, and tying in road development on the refuge with existing road system. These proposed activities improve the economic feasibility of interconnecting small village electrical loads and providing a common source of electrical generation. When addressing road development within the refuge, particularly in relation to connecting small communities, the FWS should give consideration to transmission or distribution line access.

We are continuing our evaluation of the oil and gas policy and may submit additional comments on this subject in the future.

NAVIGABILITY

11 The FWS should consider developing cooperative management agreements with the State concerning the management of navigable rivers. The State is willing to consider FWS management proposals for management of the rivers, but only upon application by FWS to the Department of Natural Resources Division of Land and Water Management. The CCP should be clarified to reflect this.

12 Page 28 - The table should include the acreage of submerged lands beneath navigable water that are in State ownership. It should also include a footnote that acknowledges the unresolved navigability status of many of the waterbodies in the refuge.

13 Page 29, Land Status Map - Rivers within the refuge that have been determined to be navigable should be identified. Additionally, the legend to the map should identify the uncertain status of lands in other drainages. At a minimum, we request that a footnote be included in the legend of the map mentioning the possibility that other rivers in the refuge may also be determined to be navigable.

14 Page 103 - We request inclusion of a section describing the navigability status of the various wild and scenic rivers in the refuge.

15 Pages 129-130 - This discussion of Navigable Waters is confusing. Two issues are being addressed in this section that could be better dealt with under separate headings. The first issue is how to manage lands under navigable waters. The second issue is how to manage the use of the watercolumns of rivers and other waterbodies in the refuge. (See next section)

We request that the discussion for Navigable Waters beginning on page 129 be replaced with the following paragraph.

> At the time of Statehood the State received ownership of the beds of navigable waters to the "ordinary high water mark". At present the (name of waterbodies) have been determined navigable. The FWS will seek cooperative agreements with the State concerning the management of submerged lands under navigable waters. FWS will make requests for the use of these lands to the appropriate State agencies.

The CCP's discussion of the upcoming land protection plan should also acknowledge that navigable rivers are a topic that will be addressed in the plan.

MANAGEMENT OF WATERCOLUMNS

16 As discussed in the section on navigability above, the FWS should include a separate section titled "Management of Watercolumn." This section should include the portions of the discussion in the section titled "Navigable Waters" that deals with the use of the watercolumn itself, not the lands under the watercolumn. The discussion should also be rewritten to acknowledge that these watercolumns remain subject to management authority by the State, although the State may choose to cooperatively manage such areas with FWS on a case-by-case basis.

17 Additionally, the sections titled "River Floating and Canoeing" on page 119 and "Power Boats" and "Non-motorized Boats" on page 121 need to be clarified. The management of these uses may require cooperative management agreements with the State. This needs to be acknowledged in the discussion about these uses.

WATER RIGHTS

18 Federal reserved water rights are created either expressly or by implication when federal lands are withdrawn from entry (by Congress or other lawful means) for federal use. It is the State's position that federal water rights, both instream and out-of-stream, are either generally or specifically reserved for the primary purposes of the reservation. Characteristics of a federal reserved water right include:

1) it may be created without actual diversion or beneficial use,

18 2) it is not lost by non-use,

3) its priority date is from the date the land is withdrawn for the primary purpose(s) involved,

4) it is the right to the minimum amount of water reasonably necessary to satisfy both existing and reasonable foreseeable future uses of water for the primary purpose(s) for which the land is withdrawn. Water for secondary purposes must be obtained under State law, AS 46.15.

Discussion at the March, 1985 meeting of the Alaska Water Resources Board emphasized the importance of two aspects of federal reserved water rights. First, they are recognized only for the primary purposes for which the land was withdrawn, and second, they apply only to the minimum amount of water reasonably necessary to satisfy the primary purposes of the withdrawal. Legislation establishing the withdrawal of land is critical, because it establishes the priority date for the federal reserved water right, and often expressly states the primary purposes of the withdrawal. All of these aspects of federal reserved water rights--the priority date, the primary purposes, and the minimum amount of water reasonably necessary to maintain the primary purposes--are important concepts that should be reflected in the plan.

We thus suggest that the first paragraph (three lines) on page 129 be replaced with the following:

> "The water resources of the Yukon Flats National Wildlife Refuge will be managed to maintain the primary purposes for which the unit was established. The primary purposes of this NWR are _____, as cited in the following legislation establishing this national wildlife refuge (reference to legislation). Water for secondary purposes and all other uses within the NWR will be applied for under AS 46.15. Specific water resource requirements for the primary purposes of the refuge will be identified and the minimum amount of water reasonably necessary to maintain these purposes will be quantified in cooperation with the State of Alaska. Once federal reserved water rights have been quantified, the Fish and Wildlife Service will file this information with the State in accordance with State laws."

LAND PROTECTION PLAN

19 The CCP should outline in detail how and when a Land Protection Plan for the refuge will be developed. The discussion should include a list of the issues the plan will address, including any proposed land exchanges, navigable rivers, RS 2477 rights-of-way and 17(b) easements.

PAGE-SPECIFIC COMMENTS

20 Page xi, COMMON MANAGEMENT DIRECTIONS, line 2 - We request the addition of "State law" to the sentence.

21 Page 7, Legal and Administrative Planning Requirements - Item (D) in this section requires the Secretary of the Interior "to identify and describe present and potential requirements for access with respect to the refuge, as provided for in Title XI", prior to development of the CCP. Given the large blocks of private land which are separated or isolated by the refuge, provision for future development of surface access should not be precluded in the CCP. Construction of that surface access may not be necessary or appropriate at this time; however, the CCP should recognize that such access may someday be warranted. We request that item (D) above be discussed in the CCP, including discussion of specific routes that may be needed in the future, and referencing Title XI provisions for their consideration in the future.

22 Page 7, lines 12 and 11 from the bottom of the page - We request that this be changed to read: "programs relating . . . to in paragraph B (above), . . .; and."

23 Page 7, line 14 from the bottom of the page - We request that this be changed to read: "resources and values;."

24 Page 15, STATE OF ALASKA POSITION PAPER, paragraph 2 - The State of Alaska Position Paper calls for cooperation between the State and FWS in "designing and implementing a harvest monitoring system capable of providing accurate subsistence data." We also suggest that it is essential for FWS to achieve the cooperation of local communities and regional organizations to assure the success of such an endeavor.

25 Page 17, Subsistence Uses, paragraphs 3 and 4 - The draft plan considers the most significant issue concerning subsistence as occurring "when 'subsistence' begins to exclude resource use by other legitimate users." The game management unit (GMU) 25D permit moose hunt is described as "favoring" local (subsistence) residents over non-local (recreational) users. Although the text also acknowledges that questions regarding subsistence remain unresolved, this description of the issue should more clearly explicate provisions in the state subsistence law and Title VIII of ANILCA pertaining to the allocation of resources for subsistence uses.

Another statement asserts that "Subsistence use of refuge resources raises a variety of other questions, as well, all of which must be considered before the Fish and Wildlife Service can satisfactorily make decisions regarding

25 subsistence use on the Yukon Flats Refuge." We would appreciate knowing what these other questions are so that the ADF&G can evaluate the questions and assist in developing potential solutions.

26 Page 20, paragraph 2, sentence 6 - This sentence currently reads: "The Yukon and its tributaries are also a key fishery." We recommend this be revised as follows: "The Yukon River and its tributaries constitute major fishery habitat." Chum salmon, which are important to the Yukon River system's commercial and subsistence fishery, should also be mentioned in this paragraph. Further, the Sheenjek River, which lies within the Yukon Flats NWR, is among the most important fall chum salmon producers in the entire Yukon River drainage.

27 Page 22, Management of Migratory Fish, paragraph 1, sentence 3 - As written, this sentence implies that there are three species of Pacific salmon. We suggest rewording the sentence to state that three of the five species of Pacific salmon indigenous to North America are found in refuge waters.

28 Page 22, paragraph 6, last sentence - The referenced maps are not in Appendix F.

29 Page 26, continuing paragraph - Subsistence fishing should also be identified among subsistence activities which occur along the Yukon River and its tributaries.

30 Page 28 - The table should acknowledge that there is an undetermined amount of land that is or may be encumbered with RS 2477 rights-of-way or 17(b) easements. This could be added as a footnote.

31 Page 43, paragraph 1, sentence 3 - We request that the words "except for the Christian River" be deleted from the sentence, so that it reads: "These waters have been identified as important salmon spawning and rearing habitat." The FWS observed chinook and chum salmon in the Christian River on August 19, 1985. This river has been nominated for inclusion in the State's anadromous fish stream catalog.

32 Page 61, paragraph 3, sentence 5 - The annual moose harvest figure in GMU 25D is given as 23 to 33 animals. As the ADF&G pointed out in earlier staff comments, this is incorrect. These figures represent the estimated moose harvest in the GMU 25D (West) permit area. (Compare the discussion in the first full paragraph on Page 100.)

33 Page 65, Bears (Grizzly and Black) - A statement should be made that salmon are also included in the bear's diet. For example, fall chum salmon are preyed upon by bears upon arrival at their spawning areas in the Sheenjek River.

34 Page 68, paragraph 3, sentence 3 - We suggest that this sentence be reworded as follows: "Escapements of salmon species bound for the upper Yukon River drainage spawning areas are directly related to the intense commercial and subsistence fisheries which occur downstream of the Yukon Flats NWR, as well as harvests which occur within the boundaries of the refuge."

35 Page 70 - A statement should be added to both sections under chinook and coho salmon that more studies are needed to accurately document the timing, distribution, and abundance of spawning by these species within the Yukon Flats NWR.

36 Page 70, Coho (Silver) Salmon - We suggest rewording the second sentence to read: "Fry emerge the following spring and remain in fresh water generally two years (sometimes one) before migrating to sea." We also suggest deleting the last sentence which states: "The refuge has many rivers and streams that are important coho salmon migration routes." This may be true, but as stated above, more studies are needed to accurately document the timing, distribution, and abundance of this species.

37 Page 71, Chum Salmon - We suggest deleting the third, fourth, and fifth sentences and inserting the following: "The Sheenjek River (part of which lies in the Yukon Flats Refuge) and the Fishing Branch River (headwaters of the Porcupine River) are two of the most important fall chum salmon producing streams in the entire Yukon River drainage. Yukon River chum salmon migrate as young-of-the-year fry to the Bering Sea soon after emergence in the spring following break-up. Adults attain sexual maturity and return to the Yukon River for spawning in their third, fourth, fifth, and sixth year of life, although age 4 and 5 fish generally account for more than 90 percent of the returns annually. Available evidence indicates that age 4 is the predominant age of return for the Yukon River summer and fall chum salmon (Buklis and Barton 1984)."

38 Page 76, Sociocultural Systems, paragraph 1, last sentence - This sentence is vague and requires further elaboration as staff have suggested in the past. The implication is that traditional kinship linkages, socialties, and value systems are changing dramatically; we are unaware of studies substantiating this.

39 Page 78, Community Infrastructure, paragraph 2 - Although it may be unintentional, the wording of the last two sentences of the second paragraph implies a relationship between tribal government and the absence or inadequacy of electricity and water systems in the smaller Yukon Flats communities. We note that becoming an incorporated community is not a prerequisite for obtaining these amenities.

Page 79, Economic Conditions - The mixed economy has been present for many years and predates the presence of government programs. The draft CCP itself notes the importance of the fur trade in the local economy beginning in the mid-1800s (see page 73).

40 Page 80, lines 2-8 - In describing the role of cash in subsistence pursuits, the draft CCP suggests a correlation between increasing cash expenditures and increased harvest range necessitated by competition for available resources. We are unclear as to the intent of this brief discussion. Does information exist which substantiates that an increase in harvest range has occurred? If so, is the increase caused by competition or other factors? The ADF&G's Division of Subsistence is not aware of any studies on this topic.

41 Page 82, Subsistence, paragraph 3, first sentence - The study has been completed and published as ADF&G, Division of Subsistence, Technical Paper 121.

42 Page 82, paragraph 4 - An explanation of navigability determinations and their legal purpose should be offered here to explain the difference between subsurface land ownership and the actual usefulness of a river for transportation. This paragraph appears to address land status rather than river transportation. The legal limits of navigability determinations do not necessarily provide a useful indication of the season long limitations on boating operations.

43 Page 83, Figure 17 - As noted previously, the State believes it is no longer necessary to include a map of RS 2477 ROWs in the CCP. The legend for 17(b) easements should refer to a document that will be available at various FWS offices where the reader can find the exact location of the 17(b) easements on more detailed maps than those included in the plan. The Department of Interior manual (601 DM 4) requires that this information be made available. The legend should also note that since Native conveyances have not been completed, the total list of 17(b) easements in the NWR is not yet known.

44 Page 94, Beaver, paragraph 2, last sentence - Preliminary findings from the Division of Subsistence study recently initiated in Beaver indicate that local residents also hunt and trap in the vicinity of Moose Island.

45 Page 96, Stevens Village - The following information is provided to update and expand the data presented: The Stevens Village resource use area extends upriver to the community of Beaver. Fall moose hunting occurs primarily along the main channels and sloughs of the Yukon River. Winter hunting takes place along the river as well as throughout

45 the Flats and surrounding foothills, in conjunction with trapping activities. Black bears are harvested primarily along certain portions of the flats north of the community. Small game is harvested throughout the area, often in conjunction with other activities. Salmon fishing camps are situated upriver from Stevens Village below Moose Island and downriver from the community along the canyon to below the Dalton Highway bridge.

46 Page 98, Recreation - The first sentence states: "Historically, recreational use of the refuge has been difficult to distinguish from subsistence use." We question the accuracy of this observation, particularly in light of the extensive information presented in this document on subsistence uses of fish and wildlife resources. The draft CCP, Page 17, alludes to a distinction between recreational and subsistence uses of wild renewable resources.

47 Page 98, Recreation-Hunting - We remain concerned about the discussion of subsistence hunting by local residents appearing in this section entitled "Recreation." A recently completed Division of Subsistence Report (Technical Paper No. 121, by Valerie Sumida and Clarence Alexander) contains updated moose harvest information for GMU 25D (West) and has been forwarded to the refuge planning team. We suggest the discussion of subsistence hunting would more appropriately be located on Page 82.

48 Page 101 - The second paragraph asserts that caribou on the refuge are harvested "exclusively" by local residents. Although most caribou hunting probably is pursued by local residents, we question whether this is "exclusive." It could be noted that current regulations do not restrict caribou hunting opportunities to local residents.

49 Pages 113-122, Management Categories - Discussions of access and the requirements of Title XI are fragmented to the point that a reader is required to comprehensively review the entire document and make correlations between statements to determine the policy regarding access. Wherever reference is made to transportation systems (roads) not being permitted, we request that an exception be added to allow for Title XI routes and for existing rights-of-way (such as RS 2477s).

50 Pages 114 to 122 - We request that the sections in Tables 11 and 12 titled "Access" (page 115), "Snowmobile Races" (page 119), "Licensed Highway Vehicles" (page 120), "Snowmobiles" (page 121), "Horses" (page 120), and "Hiking" (page 120) include a footnote referring the reader to the discussion on page 134 where FWS describes how it will address management of routes being used for access that coincide with an RS 2477 right-of-way. The CSU units were established by ANILCA subject to valid existing rights. Therefore, sections of

50 the plan noted above should identify that State management authority applies to valid RS 2477 rights-of-way and indicate that when a route coincides with an RS 2477, the management of these rights-of-way will be addressed through cooperative management agreements with the State.

51 Pages 117-122 - Table 12 is mislabeled as Figure 12.

52 Page 120, Figure 12 - We request that the access portion of Figure 12 specifically address the movement of heavy equipment across refuge lands. Winter travel with heavy equipment has historically been important to construction projects in villages and to mining operations adjacent to the refuge. Occasional need for such equipment movement can be expected in the future.

53 Page 123, Cooperative Agreements - This section should include RS 2477 rights-of-way and navigable rivers as topics where future cooperative management agreements may be appropriate.

54 Page 125, line 7 - We request that this be changed to read: "and to provide the Service and/or the State with . . . " as per ANILCA 907(b)(4).

55 Page 134 - The first full sentence indicates that use of certain types of vehicles will be limited to "designated areas of traditional use . . .." We question how these areas will be determined.

56 Page 134, Access, paragraph 1 - The third and fourth sentences need clarification. Under Alternative B, 22 percent of the refuge would be categorized as under intensive management. Under the preferred alternative, no land would be categorized as intensive management. Table 12, Page 121 shows that air boats and air-cushion boats are permitted under the intensive management scenario except in areas closed by regulation. Is it intended that the entire refuge will be closed to air boats and air-cushion boats? If so, we request that this section be rewritten to plainly state this or that sentence in question be rewritten to allow for the "exception."

57 Page 134 and 136 - The first two paragraphs about access on page 134 and on recreation on page 136 need to be clarified. These sections should identify that State management authority applies to valid RS 2477 rights-of-way and indicate that when a route coincides with an RS 2477, the management of these rights-of-way will be addressed through cooperative management agreements with the State.

58 Page 139, lines 7-12 - This paragraph states that "onshore facilities associated with commercial fishing (except existing facilities)" are incompatible with refuge purposes and are not permitted. Our comments provided to staff

58 workers during the preparation of the draft CCP asked for clarification as to what these onshore facilities might be. One of our concerns was whether such a prohibition might affect local residents who fish both for commercial and subsistence purposes. Furthermore, it is unclear whether existing onshore facilities (whatever they may be) can be replaced or rebuilt.

59 Page 140-157, Description of Alternatives - Under the Public Use and Access Management section for each alternative, motorized access to inholdings and adjacent lands would be allowed "if they are the traditional means of access." Reference to "traditional means" should be deleted and the sentence revised to allow adequate and feasible access as provided for in section 1110(6) of ANILCA. Congress clearly did not intend to limit future access to inholdings, including access to entire communities, to traditional transportation technology.

60 Page 141, FISH AND WILDLIFE MANAGEMENT - The third sentence presently reads "Management of hunting, fishing, and trapping would be the primary means of maintaining fish and wildlife populations on the refuge." We suggest adding the words "or improving" following the word "maintaining" in this sentence.

61 Page 186, Selection of a Preferred Alternative - The selection of a preferred alternative should be supported with an explanation of why that alternative is best and why it is needed. This section should summarize what protection is needed and why it is needed.

62 Page 193 - The citation for Barton is incorrect. It should be L. H. Barton and Technical Data Report No. 121. "A catalog of Yukon River salmon spawning escapements."

63 Page 193 - If the information update the ADF&G provided for page 71 is used, the correct citation is: Buklis, L. S. and L. H. Barton. 1984. Yukon River fall chum salmon biology and stock status. ADF&G, Informational Leaflet No. 239, Juneau. June 1984. 67pp.

64 Page 216, paragraph 2, last sentence - We suggest wording this sentence as follows: "There is an urgent need to locate and protect all salmon spawning areas and migration routes to ensure continued commercial, sport, and subsistence use of this important natural resource."

One final comment, in our efforts to be consistent in our comments on the refuge plans, there are three remaining general
65 concerns which we have noted in previous refuge plan reviews that apply to the Yukon Flats CCP. (1) All alternative maps displaying management categories should note in the legend that
66 these policies do not apply to non-federal land. (2) In discussions of wilderness and minimal management, there needs to be a clear distinction between non-discretionary decisions based on law and discretionary decisions based on FWS policy. (3) The
67 plan should clearly identify State management responsibilities in the refuge and indicate a clear commitment to adequate involvement of the public and the State in future planning and decision-making.

On behalf of the State of Alaska, thank you for the opportunity to review this draft Comprehensive Conservation Plan for the Yukon Flats NWR. If we can be of any assistance in clarifying these comments, please contact this office. The State looks forward to review of the final plan.

Sincerely,

Sally Gibert

Sally Gibert
State CSU Coordinator

cc: R. Davidge, DOI
J. Katz, Governor's Office, D.C.
S. Leaphart, CACFA
J. Leask, AFN
R. McCoy, ALUC
State CSU Contacts

Response to State of Alaska.

1. We do not agree with your concerns. We do not believe the language is vague or that it conflicts with statements in other sections of the plan. The Comprehensive Conservation Plan is a broad general management plan that provides guidance for future, more specific resource management plans. The alternatives are intended to provide a range of different objectives for managing the refuge, not to provide specific language as to how individual programs would be managed.

2. We do not agree. The Significant Problems chapter of the draft plan describes a number of problems which are having adverse effects on fish and wildlife habitats and populations on the refuge. The most evident problem is the lack of adequate data on wildlife populations, habitats, and their use. Without additional study and research many of the problems affecting fish and wildlife on the refuge may not be known.

   One potential problem you discuss is the adherence to resource harvest regulations on the refuge. We agree that this may be a problem and have added additional wording to the discussion under Difficulties in Managing the Refuge. In addition, we have added language to the Common Management Directions on Cooperation and Coordination with Other Government Agencies and Education/Interpretation which identifies the need for a cooperative education effort related to the need for adherence to resource harvest regulations on the refuge and the need for improved enforcement. However, without further documentation of violations of regulations the Service does not feel a statement that illegal harvest is a significant problem in preventing attainment of population goals on the refuge is appropriate.

3. We have worked with the ADF&G/FWS liaison in correcting errors in the information presented in the draft plan and in incorporating any additional information which may be available.

4. The table of activities permitted in the various management categories (Table 13 in the final plan) has been modified to reflect recent policy changes in the region. Permanent fish hatcheries and physical fish habitat manipulation are now allowed in all management categories. Although allowed, permanent fish hatcheries would not normally be permitted in wilderness. Mechanical habitat manipulation is allowed in moderate as well as intensive management. These activities are permitted on a case-by-case basis subject to provision of NEPA and a compatibility determination. Other changes have also occurred in this table.

   Understanding the concept of the management categories is necessary to understand why all management actions and permitted uses are not allowed in all management categories. A management category is a set of refuge management directions applied to an area (in light of its resources and existing and potential uses) to facilitate management and accomplishment of refuge purposes (as required by ANILCA). Therefore, management actions and permitted uses, including those associated with management of fish and wildlife populations and habitats, will vary between management categories.

   We believe that the Comprehensive Conservation Plan and Upper Yukon/Tanana Fire Management Plan are compatible. It is true that mechanical manipulation was not permitted under the moderate or minimal management categories of the plan as a routinely acceptable management practice in the draft plan (mechanical manipulation is permitted in moderate management areas in the final plan). However, the final plan does not preclude using mechanical manipulation on lands under all management categories in emergency situations. If mechanical manipulation is necessary to control fires threatening high value resources or private property, then these methods will be allowed (although the land management agency has the discretion to select the methods to be used which, in the case of the Service, would generally be the minimum tool available to do the job). In addition, the use of prescribed fire as a means of habitat improvement is permitted in all the management categories presented in this plan.

5. Natural fluctuations in the population of various wildlife species occur without any direct management application - as the result of various natural phenomena such as predation, starvation, injury, and disease. Management actions, such as the relocation or removal of predators to favor other wildlife populations or to protect reintroduced species, would be permitted where such action can be biologically justified. Pest control and disease prevention and control would also be permitted, but only where severe resource damage is likely, where public health or safety is jeopardized, or if it is to control exotic species. See Table 13.

6. The Service believes the discussion in the draft plan, coupled with the additional information being provided in the final plan, adequately covers the issue of access. Non-exclusive use easements, 17(b) easements, and possible RS 2477 rights-of-way have all been addressed in the Management Alternatives chapter.

7. A more detailed discussion of 17(b) easements has been added to the final plan, including a description of easement types and uses and information on the Service's management intent for these easements. It is not feasible to include a list of all 17(b) easements and their allowed uses.

   The "Public Access" common management direction in the final plan states that the plan does not provide specific policy guidance for the management of 17(b) easements, the use of nonexclusive easements, or the resolution of conflicts with Native allotments when the allotment conflicts with public use values. The Service will work with the State of Alaska and other interested parties in the development of these policies. Department of the Interior regulations have been developed for administration of 17(B) easements (Department Manual 601 DM 4) and have been referenced in the common management directions related the these easements.

8. Additional discussion of RS 2477 rights-of-way has been added to the discussion in the Affected Environment chapter. A list of the potential RS 2477 rights-of-way in the Yukon Flats Refuge is included in Appendix K along with a map of these possible rights-of-way.

   We recognize the concerns related to potential trespass problems resulting from the identification of potential RS 2477 rights-of-way on a map in the plan. However, the Regional Office has been instructed by the Department of the Interior to include a map in the appendix of each plan depicting the potential RS 2477 rights-of-way within the boundaries of the given refuge.

The following agreed to language regarding RS 2477 rights-of-way replaces the language on page 134 of the draft Yukon Flats Plan:

Revised Statute 2477 (formally codified at 43 U.S.C. 932; enacted in 1866) provides that: "The right-of-way for the construction of highways over public lands, not reserved for public uses, is hereby granted." The Act was repealed by P.L. 94.570 as of October 21, 1976, subject to valid existing claims. The Yukon Flats Refuge is subject to valid existing rights, including rights-of-way established under RS 2477. The validity of these rights-of-way will be determined on a case-by-case basis.

A map illustrating the rights-of-way that the state contends may be valid under RS 2477 for the Yukon Flats Refuge is included as Appendix K of this document. This map is not necessarily all inclusive. Private parties or the State of Alaska may identify and seek recognition of additional RS 2477 rights-of-way within the refuge. Supporting material regarding those rights-of-way identified by the state may be obtained through the Alaska Department of Transportation and Public Facilities or the Alaska Department of Natural Resources.

Identification of potential rights-of-way in the map does not establish the validity of these RS 2477 rights-of-way and does not necessarily provide the public the right to travel over them. All RS 2477 rights-of-way within the refuge shall be subject to appropriate state and federal laws and regulations.

9. Under Title XI of ANILCA, transportation and utility systems could be constructed on or across the Yukon Flats Refuge in all management categories under all alternatives where valid existing rights are involved. Any proposed system would be evaluated to determine its potential environmental impacts. The transportation system would be permitted if it is determined that the system would be compatible with the purposes for which the refuge was established and there is no economically feasible and prudent alternative route for the system. Restrictions may apply on the methods of transmission/pipeline placement.

10. See response 9 above.

11. Language has been added to the common management direction for Navigable Waters which states that "the Service will coordinate with the appropriate State agency and attempt to cooperatively resolve any issues" related to use of navigable waters prior to exercising its authority to regulate certain activities on navigable rivers which affect refuge lands.

12. A note has been added to Table 3 (Land status) stating that submerged lands beneath navigable waters are in State ownership. The note acknowledges the unresolved navigability status of many of the waterbodies on the refuge. Given time and budget constraints it is not possible for the Service to estimate the acreage of submerged lands under navigable waters in the plan.

13. Those waters that have been determined to be navigable on the refuge are identified in the section on Land Status in the Affected Environment chapter of the final plan. A note has been added to the land status map which indicates that submerged lands beneath navigable waters are in State ownership. It also acknowledges the unresolved navigability status of many of the waterbodies on the refuge. A discussion of the importance of rivers and streams as transportation routes is included in the Access section of the Affected Environment chapter in the final plan.

14. The navigability status of Beaver Creek National Wild River and the two study rivers, the Sheenjek and Porcupine, has been included in the Wild and Scenic Rivers discussion in the Affected Environment of the final plan.

15. The following agreed to language has replaced the common management direction for navigable waters as it appeared in the draft plan:

    Shorelands, Tidelands, and Submerged Lands. The Submerged Lands Act of 1953, the Alaska Statehood Act of 1958, and the state constitution provide for state ownership of water (subject to the reservation doctrine discussed under water rights), shorelands, and submerged lands.

    Determinations of what waters are navigable is an ongoing process in Alaska at both the administrative and judicial levels. Navigability determinations have been made by the BLM on many of the waterbodies on the refuge, either as part of the conveyance process or through BLM's regional planning. Pursuant to Section 901(g) of ANILCA, those determinations are for the purpose of determining title to lands beneath navigable waters as between the United States and the State of Alaska. Refuge waters determined to be navigable are identified in the Land Status section of the Physical Environment chapter. Other water bodies may be determined to be navigable in the future.

    The Service will work cooperatively with the state to ensure that existing and future activities occurring on the shorelands, tidelands, and submerged lands are compatible with the purposes for which the refuge was established. In the future the Service may propose management actions to the state for these areas. The Service will pursue cooperative agreements with the state for the management of lands under navigable water bodies.

16. The following agreed to language for management of watercolumns has been added to the common management directions:

    Management of Watercolumns. The Service has authority to regulate certain activities on watercolumns to protect refuge lands, to protect the use of navigable waters for fishing, boating, and other recreational uses, and for conservation purposes. These authorities stem from two provisions of the United States Constitutions (the Property Clause and the Commerce Clause), ANILCA, and other authorities including the National Wildlife Refuge Administration Act of 1968, the 1899 Rivers and Harbors Act, the Fish and Wildlife Coordination act of 1958, and the Migratory Bird Treaty Act. The State of Alaska also has authority to manage water based on the laws cited in the section on shorelands, tidelands, and submerged lands above. These laws provide for water management by both the State and the Service.

    The Service will pursue cooperative management agreements with the State of Alaska regarding public uses on waterways in the refuge. Cooperative agreements will be pursued only if a case-by-case resolution of management

issues proves unacceptable to the Service and the State. The Service will oppose any uses of waterways that will adversely affect water quality or the natural abundance and diversity of fish and wildlife species in the refuge.

17. A note has been added to Table 13 indicating that management of activities occurring on waters which have been determined to be navigable will be coordinated with the appropriate State agencies. This information has also been added to the text, where appropriate.

18. The following common management direction for water rights replace the language in the draft plan:

    "The water resources of the Yukon Flats Refuge will be managed to maintain the primary purposes of the refuge, as stated in Section 302(9)(B) of ANILCA and in other statutory mandates. Specific water resource requirements for the primary purposes of the refuge will be identified and the reasonable amount of water necessary to maintain these purposes will be quantified in cooperation with the State of Alaska. Once Federal Reserved Water Rights (FRWR) have been quantified, the Service will record this information with the Alaska Department of Natural Resources. Water for secondary purposes and other uses not provided for by FRWR will be applied for in accordance with Alaska Statutes (AS) 46.15.

    Following adoption of the comprehensive conservation plan for the Yukon Flats Refuge, a water resource management plan will be prepared. This plan will identify streams, lakes, and other water bodies whose protection has highest priority and will outline procedures for quantifying their FRWR. The Service will cooperate with the state in obtaining these data.

    Instream flow studies will investigate the full annual range of flow, as both flood and low-water stages are essential, or even critical, in the life cycles of wetland and aquatic species. Extreme flood and drought years will also be included in the analysis, as both are important to the renewal of aquatic habitats. Once year-round instream flow requirements have been quantified, the Service will continue to monitor streams which may be subject to modification both within and outside the refuge. The Service will contact other water users if it determines that a proposed project threatens refuge waters, fish, or wildlife. Reductions in instream flows, lake elevations, or groundwater levels below the FRWR will be reported to appropriate state or federal agencies so that action can be taken to maintain the purposes for which the refuge was established."

19. The Service does not prepare land protection plans.

20. The term "and State" has been added.

21. A more detailed discussion of Title XI and future access needs on the refuge has been incorporated into the final plan. Only Doyon Limited has identified any potential access needs which would cross refuge lands. They have identified three possible access routes into their lands in the Birch Creek/Fort Yukon area, one of which could be developed at some point in the future. Possible RS 2477 rights-of-way have been identified, but no discussion of potential development of these rights-of-way, if they are determined to be valid, has been provided by the State.

22. The requested change has been made.

23. The requested change has been made.

24. Your comment is noted and wording in the final plan has been changed.

25. This discussion has been deleted from the final plan.

26. The requested change has been made and the additional information added.

27. This sentence has been rewritten.

28. Reference to these maps has been deleted from the final plan.

29. Fishing has been added to the list of subsistence activities.

30. A note to Table 3 concerning RS 2477 rights-of-way and 17(b) easements has been added.

31. The requested change has been made.

32. This information has been corrected.

33. This statement has been added.

34. The requested change has been made.

35. These statements have been added.

36. The requested rewording of the second sentence has been done. We see no reason to delete the last sentence.

37. The requested change has been made.

38. This sentence has been deleted from the final plan.

39. This wording has been changed. The inference was purely unintentional.

40. The intent of this discussion is to show that cash is a necessary item for those residents participating in a subsistence "lifestyle." The reference to an increased harvest range has been deleted from the final plan.

41. The report you reference, Technical Paper 121, is not the report which is referred to in this discussion. Technical Paper 121 is a report on moose hunting in Western Game Management Unit 25(D) Permit Moose Hunt Area, not the Stevens Village subsistence study to which the Service is referring.

42. Navigability determinations have been made by the BLM on many of the waterbodies on the refuge, either as part of the conveyance process or through BLM's regional planning. Pursuant to Section 901(g) of ANILCA, those determinations are for the purpose of determining title to lands beneath navigable waters as between the United States and the State of Alaska.

The discussion of navigability determinations has been moved from the section on access and transportation to the land status section of the Affected Environment chapter. The access and transportation section now includes only a discussion of the use of waterways as transportation corridors providing access to lands within the refuge boundary or access through the refuge.

43. As noted previously, the possible RS 2477 rights-of-way are depicted on a map (Appendix K) as directed by the Department of the Interior. The legend for the 17(b) easement map and the discussion in the text will include the additional information you have requested.

44. This information has been added to the text.

45. This information has been added to the text.

46. The introductory paragraph to the section on recreational use of the refuge has been rewritten. To define what is considered subsistence use and what is considered recreational use is simple if all hunting, fishing, and gathering activities undertaken by local residents is considered subsistence and all such activities undertaken by non-locals is considered recreation. This is the approach taken in the Yukon Flats plan.

47. The discussion of subsistence hunting has been removed from this section, except as necessary to support the discussion of recreational hunting.

48. Your concern is noted and the wording has been changed.

49. A more extensive discussion of access and Title XI has been included in the final plan. Hopefully, this discussion has addressed your concerns. We have incorporated wording relative to allowances for Title XI routes and for existing rights-of-way where appropriate.

50. Your concerns have been noted. We do not see the necessity of adding a footnote to Table 13 for this purpose. Appropriate wording has been included in the final plan relative to State management of valid RS 2477 rights-of-way and the possible need for cooperative management where other access routes coincide with these RS 2477 rights-of-way.

51. The correction has been made.

52. We do not see the need to add this activity to Table 13. Section 1110(b) assures adequate and feasible access for economic and other purposes in any case in which State owned or privately owned land, including subsurface rights, or a valid mining claim or other valid occupancy is within or is effectively surrounded by national wildlife refuges or other conservation system unit. This includes activities such as the movement of heavy equipment for the purposes you indicate.

53. Your concerns are noted. A brief discussion of other areas where cooperative agreements may be appropriate in the future has been added.

54. The requested change has been made.

55. This sentence, and parts of the preceding paragraph, have been rewritten.

56. See response 49 above.

Table 13's reference to air and air-cushioned boats is incorrect and has been corrected. Air and air-cushioned boats are considered in the category of Other Motorized Vehicles in Table 13 of the final plan) and are prohibited on the refuge except in areas expressly opened by regulation.

57. Your concerns have been noted. See responses 49 and 50 above.

58. On-shore facilities related to commercial fishing include cabins, gear sheds, smokehouses, tent frames and platforms, and processing facilities. The refuge staff is not aware of any on-shore facilities associated with commercial fishing on federal lands within the refuge currently. A limited number of commercial fishing permits are held by local residents with most commercial fishing activities occurring outside the refuge or from Native inholdings or allotments. Existing on-shore facilities, if any exist on the refuge, could be replaced or rebuilt provided use of these facilities remained at or below the level of such activity in 1979 as per Section 304(d) of ANILCA.

59. Your concern is noted and new wording has been incorporated.

60. The Fish and Wildlife Management discussion under Alternative A has been substantially revised and the sentence referred to in this comment has been deleted.

61. The information presented in the Evaluation of the Alternatives section provides the comparative information which supports the Service's selection of Alternative D as the preferred alternative. In the final plan, we have included tables which evaluate how the alternatives address the issues and concerns identified during the scoping process and how the alternatives address the purposes for which the refuge was established.

62. The corrections have been made.

63. This citation has been added to the List of References.

64. Wording has been changed.

65. Note has been added to the maps.

66. This information has been added to the discussion of Management Categories at the beginning of the Management Alternatives section.

67. State management responsibilities have been identified in the appropriate sections of the final plan.

The Service's commitment to involvement of the public and the State in future planning and decision-making has always been clearly indicated in the Yukon Flats Plan. Additional language supporting this commitment has been added where appropriate.

Doyon, Limited

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February 10, 1986

Mr. Robert Gilmore
Regional Director
U.S. Fish & Wildlife Service
Region 7
1107 East Tudor Road
Anchorage, AK 99503

Attn: William Knauer

Re: Yukon Flats Draft CCP/EIS/WR

Dear Mr. Gilmore:

Doyon, Limited welcomes this opportunity to comment on the Yukon Flats (Alaska) National Wildlife Refuge Draft Comprehensive Conservation Plan, Environmental Impact Statement and Wilderness Review (all hereinafter referred to as "the draft plan").

Doyon, Limited ("Doyon") is the regional corporation for Interior Alaska formed under the provisions of the Alaska Native Claims Settlement Act of 1971 ("ANCSA"), P.L. 92-203, as amended. Doyon is a significant inholder within the boundaries of the Yukon Flats NWR having thus far received title to approximately 1.75 million acres of fee and subsurface interests in various parts of the refuge pursuant to the terms of ANCSA. Doyon will likely be conveyed an additional 750,000+ acres in the refuge in coming years. Thus, Doyon's present and future ownership interests wholly within the boundaries of this 8.5 million acre

refuge are truly significant. Doyon is obligated and committed to its 1,351 shareholders and their families who live in the Yukon Flats to make our best efforts to ensure that the traditional lifestyles of those shareholders are not adversely affected by implementation of the final refuge management plan. Doyon is similarly obligated and committed to all of its 9,061 shareholders to preserve their ability and the ability of Doyon to create economic development opportunities on private lands within the Yukon Flats NWR. It is with these two primary considerations in mind that Doyon makes its comments.

First, we would like to generally commend the U.S. Fish & Wildlife Service ("USFWS") for the efforts undertaken thus far in putting together the draft plan for the Yukon Flats NWR. There is much work still to be done and there are a number of serious deficiencies and erroneous approaches in the plan, but we do recognize some of the problems associated with putting together a plan of this magnitude and thus look forward to working with you to improve upon what we consider to be a good start in most areas.[1/]

[1/] In contrast, USFWS efforts on the Tetlin NWR plan, both in quality and in quantity, pale in comparison to the instant plan and, thus, planning and management for that refuge is off to a poor start.

THRESHOLD DEFICIENCIES

The draft plan has been developed as a result of the Congressional mandate found at Section 304(g) of the Alaska National Interest Lands and Conservation Act ("ANILCA") of 1980, P.L. 96-487. ANILCA is the same act of Congress which created the Yukon Flats NWR at Section 302(g). Section 304 (g)(2) requires the Secretary of the Department of the Interior to "identify and describe" several matters "[b]efore developing a plan for each refuge." We believe that certain of these matters, addressed below, were not adequately identified and described and thus the draft plan is seriously flawed at this point. However, we believe that additional work could likely cure these problems.

1 Section 304(g)(2)(B) requires that each plan identify and describe certain special values, among them, those of archeological, cultural, and historical importance. In our opinion, the research thus far conducted by USFWS in these areas is wholly inadequate. As a result, no special values of these types were identified at pps. 25-26.

We are aware of two major studies in these areas which were not utilized by USFWS as part of its review.[2] These studies do identify special values. There are numerous places throughout

[2] Report on the Cultural Resources of the Doyon Region, Central Alaska, Elizabeth Andrews, Occasional Paper No. 7, October 1977. Yukon Flats Cultural Resources Survey; Doyon, Limited; Dale Slaughter, 1983.

1 the refuge that the local residents hold dear because of special archeological, cultural, and historical values. We believe, as did Congress, that full review and ultimate recognition of these values is a vital component of the framework of any planning process. Without this component, the ability of USFWS to develop a productive relationship with the local people could very well be impaired.[3]

2 Next, Section 304(g)(2)(D) requires the pre-plan identification and description of "... the present and potential requirements for access with respect to the refuge, as provided in Title XI ...". The draft plan has failed to meaningfully address this issue with respect to the rights of corporations and individuals to potentially develop their inholdings. While the draft plan does state, perhaps erroneously, at pps. 17-18, that private inholdings are more likely to be developed than refuge lands, there has been little effort to recognize, or at least acknowledge, every inholder's guaranteed right of access across refuge lands to and from his property for economic purposes.

Title XI of ANILCA, referenced above, addresses "transportation and utilities systems in and across, and access into conservation system units." This title sets forth the general, procedural, and substantive framework to deal with possible

[3] We acknowledge that some archeological work has been done and additional work is in progress. Draft Plan at p. 75.

2 future transportation and utilities system needs in Alaska; there is no developed network of transportation and utility corridors in Alaska, and it was recognized by Congress that there may be a future need to cross the lands of Alaska's newly created conservation systems. However, in addition to this general framework, there are special, independent provisions dealing with access rights of inholders in conservation system units such as the Yukon Flats NWR. These provisions are set forth below:

VALID EXISTING RIGHTS

> Sec. 1109. Nothing in this title shall be construed to adversely affect any valid existing right of access.

SPECIAL ACCESS AND ACCESS TO INHOLDINGS

> Sec. 1110(b). Notwithstanding any other provisions of this Act or other law, in any case in which State owned or privately owned land, including subsurface rights of such owners underlying public lands, or a valid mining claim or other valid occupancy is within or is effectively surrounded by one or more conservation system units, national recreational areas, national conservation areas, or those public lands designated as wilderness study, the State or private owner or occupier shall be given by the Secretary such rights as may be necessary to assure adequate and feasible access for economic and other purposes to the concerned land by such State or private owner or occupier and their successors in interest. Such rights shall be subject to reasonable regulations issued by the Secretary to protect the natural and other values of such lands.

The only reference to access to private inholdings is found at page 125 of the draft plan. This portion of the draft plan states as follows:

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> State and private interests with valid subsurface or occupancy rights on or adjacent to the Yukon Flats Refuge will be permitted reasonable access across the refuge in accordance with section 1110(b) of ANILCA. Such access will be subject to reasonable regulations that protect refuge resources and public health and safety.
>
> ANILCA ensure [sic] access to private inholdings, so these lands can be utilized for activities such as construction of fish wheels as Art James, Sr. is doing here.

Little is revealed by these remarks. In fact, USFWS's approach is somewhat misleading. Most who read the draft plan would assume that access rights for only traditional hunting and gathering activities are protected.

ANILCA, through the language of Sections 1109, 1110, and relevant legislative history, clearly guarantees access rights for all purposes, including economic development. It is perhaps important to quote from the legislative history so to further emphasize this point.

> The subsection on access to inholdings, provides that, where a State or private interest in land is surrounded by one or more conservation system units ... the <u>Secretary shall grant</u> the owner of the private interest <u>such rights as may be necessary to assure adequate access for economic and other purposes</u>.
>
> The Committee enacted this provision in recognition of the fact that restrictions placed on public access on or across many federal land areas in Alaska may interfere with the ability of private inholders to exercise their right to use their lands. The <u>Committee believes that owners of inholdings should not have their ability to enjoy their land reduced simply because restrictions are placed on general public access to the land surrounding their inholdings. This provision</u>

2

directs the Secretary to grant the owner of an inholding such rights as are necessary to assure adequate access to the inholding, and is intended to assure a permanent right of access to the concerned land across, through or over these Federal lands by such State or private owners or occupiers and their successors in interest. The Committee recognizes that such rights may include the right to traverse the Federal land with aircraft, motorboats, or land vehicles, and to use such part of the Federal lands as are necessary to construct safe routes for such vehicles.

The Committee adopted a specific standard regarding access which is designed to include inholders and other landowners where lands are effectively surrounded by a unit or units established by this Act. The Committee finds that in certain instances, there will be a need for access to be effected across such units and expects the Secretary to be reasonable and fair in his judgments regarding access to these situations. ...[T]he Committee expects the Secretary to judge these situations on a case-by-case basis and to work with the inholder to come to a reasonable solution which will assure that adequate and feasible access for economic and other purposes can be realized.

The Committee adopted a standard providing for adequate and feasible access for economic and other purposes. The Committee believes that routes of access to inholdings should be practicable in an economic sense. Otherwise, an inholder could be denied any economic benefit resulting from land ownership. ...

The Committee understands that the common law guarantees owners of inholdings access to their land, and that rights of access might also be derived from other statutory provisions, including other provisions of this title, or from constitutional grants. This provision is intended to be an independent grant supplementary to all other rights of access, and shall not be construed to limit or be limited by any right of access granted by the common law, other statutory provisions, or the Constitution. (emphasis added).

2 S.Rep. 96-413, Nov. 14, 1979, pp. 248-249.

Thus, regardless of whether the issue involves, for example, (1) a native allottee who may wish to develop or expand a commercial fishing operation or a back country hunting and fishing lodge on his property which might require road access from a Yukon Flats village, or, (2) a commercial timber cooperative of several Yukon Flats village corporations which likewise might require road linkage among and between villages across refuge lands, or, (3) subsurface oil and gas development requiring a utility corridor for a pipeline across refuge lands, private access rights for development purposes are not adequately dealt with in the draft plan.

Furthermore, because of these guaranteed rights of access and the recognized near term potential for certain types of development, such as those mentioned above, we believe that the plan must, in accord with Section 304(g)(2)(D), identify and describe these needs. Such needs should be dealt with in general and/or specific terms, depending on the level or degree of planning which the inholder himself has undertaken. Thus, it is incumbent on USFWS to contact the inholders and solicit their remarks with respect to economic plans, if any. To our knowledge, this has not been done, at least with respect to Doyon.

SUBSISTENCE

As mentioned earlier, Doyon has 1,351 shareholders who reside in the rural villages of the Yukon Flats. Many of these

people and other local residents qualify for the subsistence priority found at Title VIII of ANILCA which entitles them to harvest renewable refuge resources when stocks are insufficient to prudently allow harvest by other user groups. The draft plan, at page 78, recognizes the importance to the local residents of their numerous hunting and gathering activities.

We note that long-term protection of fish and wildlife populations and their habitats are essential to assure continuation of the opportunity for Yukon Flats residents to participate in subsistence activities. We at Doyon are obviously very interested in and concerned about the conservation of these populations and their habitats. We are also very concerned about the fact that so little is really known about the fish and game populations and their habitats and uses, as was pointed out in the draft plan at pps. 19-20. We thus see a serious need for USFWS to acquire additional information about all of the renewable resources located within the boundaries of the Yukon Flats NWR, irrespective of land ownership patterns. Therefore, as a major inholder, we take this opportunity to formally express our interest in developing cooperative management agreements with USFWS, Yukon Flats village corporations, and perhaps the State of Alaska as generally envisioned by Congress when that body passed sections 304(f) and 809 of ANILCA. Such agreements will likely enhance the ability of USFWS to fulfill its dual legislative mandates to preserve and enhance fish and game populations and

habitats in the Yukon Flats NWR while maximizing continued local subsistence activities.

However, before Doyon would entertain or proffer suggestions with respect to cooperative management agreements, we will need to see a change in attitude by USFWS with respect to local subsistence activities and a demonstration of a better understanding of the subsistence priority law found at Title VIII of ANILCA.
3 We come to this conclusion after reviewing those portions of the draft plan which address subsistence activities, especially page 17. There, subsistence uses are identified as one of several "significant problems" affecting the Yukon Flats NWR. By categorizing subsistence as a problem, we believe that USFWS discloses, at a minimum, a serious misunderstanding of a clear legal mandate. Such a conclusion is further borne out by the draft plan's discussion of this so-called problem.

The draft plan notes that ANILCA simply "provides for" subsistence. ANILCA does much more. Congress, through Title VIII of ANILCA, set forth a very definite policy with respect to (1) management and conservation of renewable resources in a manner causing the least adverse impact on rural residents who depend on subsistence uses of those resources, and (2) a preference and first priority use for defined subsistence uses to be accorded certain clearly defined rural residents when necessary to restrict the taking of fish and game and other renewable

resources.[4] Additionally, numerous rights, responsibilities, and procedures with respect to federal government participation in this process are set forth.

4 USFWS's misguided approach to the subsistence issue is further revealed by other comments on page 17 involving the apparent position of USFWS that it does not know who is a subsistence user. Section 804 together with the relevant legislative history[5] make it manifestly clear that when a subsistence priority allocation is necessary, it shall be accorded to certain individuals based upon the following criteria:

> (1) customary and direct dependence upon a [fish and game] population as the mainstay of livelihood;
>
> (2) local residency; and
>
> (3) the availability of alternative resources.

And had the drafters of this section of the plan taken the time to become fully conversant with Title VIII and recent events, they would not have incorrectly stated, again on page 17, that "... subsistence is basically a state issue ...".[6] Subsis-

[4] One of the purposes for which the Yukon Flats NWR was established was to provide for the opportunity for continued subsistence uses by local residents. ANILCA Section 304(9)(B)(iii).

[5] S.Rep. 96-413, Nov. 14, 1979, pps. 230-235 and 267-275.

[6] We do note that the plan's section on subsistence use management at pps. 131-134 has a relatively concise and accurate though somewhat incomplete explanation of the State's role in Title VIII.

4 tence is without question a federal matter over which the State of Alaska was only given the opportunity, with federal oversight, to attempt to carry out the mandate of Title VIII by enacting laws of general applicability which are consistent with and provide for the definition, preference, and local participation in decision making as specified by sections 803, 804, and 805 of ANILCA. As USFWS should be aware, the state's law of general applicability has been recently interpreted in the now famous Madison decision so to grant a subsistence preference in certain situations to urban residents. Thus, state law is not consistent with federal law and, as a result, Bill Horn, Assistant Secretary of the Interior for Parks and Wildlife, has recently informed the State of Alaska that unless the state enacts a new law consistent with Title VIII, the federal government will reassume federal management of subsistence activities on federal lands. This recent action taken by the Interior Department official in charge of USFWS should conclusively put to rest any questions concerning the federal or state nature of the subsistence issue on federal lands in Alaska. We also believe that it would be appropriate to address this recent development in the plan's description of subsistence use management at pps. 131-134.

5 Continuing with our subsistence comments arising from page 17 of the draft plan, we note a not-too-subtle inference that there is something wrong with the special permit hunt which "favors" local subsistence users over nonlocal recreational users as a result of low moose populations in Unit 25D. Title VIII was

5 enacted to provide just such a priority among all user groups. There is no productive purpose served by drafting language which can only further inflame the passions of the different user groups.

6 Moreover, again with respect to page 17, we are completely baffled by the following statement:

> The proximity, size, and pattern of local residents' private inholdings within the refuge raise the question of who, if anyone, has exclusive rights to use the resources on refuge lands.

It is our understanding that no one person or group has any exclusive rights to use refuge resources. One group, certain local residents, is granted a preference and priority in limited situations. Further, the pattern of private holdings is absolutely irrelevant to the subsistence question because private ownership of land in the refuge is not one of the Section 804 criteria to be utilized in determining who qualifies for any subsistence priority.

We strongly urge a complete revision of page 17 once a better understanding of the subsistence law is reached. Then, perhaps, after the federal subsistence mandate is better understood by USFWS personnel, professional attitudes will change with respect to the laws which they are required to carry out.

LOCAL HIRE

The draft plan at pages 22-23 describes certain "Difficulties in Managing the Refuge." One of the major problems

addressed are difficulties associated with the great expanse of the refuge as this fact relates to a small staff located far from the refuge in Fairbanks which inhibits their ability to adequately monitor and controll uses in the refuge. As an option to assist in remedying these problems, the plan notes that:

> Use of local hires, or stationing personnel on the refuge, would reduce the time and expense involved in issuing use authorizations as well as improve the level of enforcement, surveillance, and monitoring of uses on the refuge.

We, too, believe that local hire could greatly contribute to and assist in the achievement of certain management goals. Furthermore, local hire would likely engender a more positive relationship between USFWS through visibility, economic benefits, and a blurring of the present sharp distinction between "us" (locals) and "them" (USFWS personnel from Fairbanks). Furthermore, we do not interpret Section 1308(a) of ANILCA to grant USFWS the mere option to consider use of local hire. Section 1308(a) states in relevant part that:

> ... [T]he Secretary [DOI] shall establish a program under which any individual who, by reason of having lived or worked in or near a conservation system unit, has special knowledge or expertise concerning the natural or cultural resources of such unit and the management thereof (as determined by the Secretary) shall be considered for selection for any position within such unit without regard to [civil service laws requiring formal training and like issues]. (emphasis added).

The legislative history of Section 1308(a) notes that:

> Like the House, the Committee expects the agencies to make a concerted effort to hire local residents when possible and to take

advantage of the special knowledge and expertise that local residents often possess.

S.Rep. 96-413, Nov. 14, 1979, p. 305.

Thus, it should be clear that USFWS has a distinct obligation to make special efforts to hire local residents, especially when they possess knowledge and expertise that would be of special value to USFWS. We believe that a majority of the adult residents of the Yukon Flats fit into this employment pool. Over five years has passed since the signing into law of ANILCA and the creation of the Yukon Flats NWR. Yet we have failed to see the "concerted effort" to hire local residents that Congress so clearly prescribed.

AGRICULTURE

338

7 The draft plan at page 36 states that:

> Several milion acres of agriculturally suitable soils are present in the vicinity of the Yukon Flats. Warm summer temperatures and extended daylight are conducive to growing a variety of crops.
>
> ANILCA recognizes the agricultural potential of lands in the Yukon Flats Refuge. Section 1324 states that "Nothing in this Act or other existing law shall be construed as necessarily prohibiting or mandating the development of agricultural potential within the Yukon Flats National Wildlife Refuge ... permissibility of such development shall be determined by the Secretary (of the Interior) of a case-by-case basis ...".

However, the draft plan also notes, at page 139, that agricultural development would not be permitted under <u>any</u> of the five management alternatives included in the plan because USFWS has determined that all such activity is incompatible with refuge

7 purposes. Obviously, this determination and position of USFWS is in direct conflict with Section 1324. The permissibility or incompatibility of all agricultural development purposes can only be determined on a "case-by-case basis."

FIRE SUPPRESSION

The draft plan at pages 20-21 categorizes fire suppression as one of the "Significant Problems" of the refuge. While fire fighting activities may create some management headaches for USFWS as refuge manager, fire suppression on native land will continue. There is, in general, some recognition on our part of the beneficial effects of wildfires on many facets of the ecology of the Yukon Flats. However, the human inhabitants of the Yukon Flats are also part of this ecology.[1] Without fire fighting activities, whole villages could be obliterated, lives lost, and ways of life extinguished. We hope to work with you to maximize your goals and the needs of our shareholders in the Yukon Flats.

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[1] In discussing ANILCA's subsistence uses, the report of the Senate Energy and Natural Resources Committee noted that it included "... the phrase 'conservation of healty populations of fish and wildlife' to mean the maintenance of fish and wildlife resources and their habitats in a condition which assures stable and continuing natural populations and species mix of plants and animals in relation to their ecosystems, including recognition that local rural residents engaged in subsistence uses may be a natural part of that ecosystem ..." S.Rep. 96-413, Nov. 14, 1979, p. 233.

Though not noted in the draft plan, USFWS is surely aware that federal wildfire protection services on native lands are required under the terms of Section 21(e) of ANCSA. As such, we believe it important at this time to state our position, that in some circumstances, wildfire suppression activities could be required on refuge lands as necessary so to provide a protection buffer around native lands. The draft plan's discussion of fire management at page 131 seems to embrace this concept not too clearly.

8

BIRCH CREEK WATER QUALITY

We are in agreement with the draft plan at pages 21-22 that water pollution problems on Birch Creek should be categorized as one of the significant problems of the Yukon Flats NWR. We also agree with the discussion and conclusions reached in draft plan at pages 21-22 and the plan goals outlined at pages 128-129. We mention this issue to underscore the importance of this issue and to admonish USFWS to give its fullest attention to (1) collect additional base data, especially with respect to toxic heavy metals discharge associated with placer mining, and (2) require strict enforcement of existing well-defined water quality standards.

LAND EXCHANGE

The draft plan at page 126 states that it is interested in acquiring certain inholdings so to help reach management objectives. Doyon is not interested in exchanging any of its holdings

in the Yukon Flats NWR. And, while we do not presume to speak for the village corporations in the Yukon Flats, we doubt that there would be much interest on their parts either. In comments made earlier in this letter, we have, however, expressed an interest in discussing cooperation management agreements.

ACCESS

We have already addressed certain access concerns and we shall return to one facet of our earlier concern in later comments. There are other access issues and USFWS positions raised in the draft plan which require comment.

R.S. 2477 right-of-way questions have been getting much attention in recent years. Yet little of substance has been resolved, especially with respect to the validity of such assertions on native lands. Doyon, and numerous other native corporations, have taken the position that no R.S. 2477 rights-of-way can exist on native holdings. The legal arguments supporting this position are unnecessary to our comments today. However, because several of the R.S. 2477 claims asserted by the State of Alaska on refuge lands connect to easements reserved to the United States which cross native lands under Section 17(b) of ANCSA, the actions of USFWS will necessarily affect Doyon. For this reason, we are offering comments on the draft plan's treatment of the R.S. 2477 issue.

If one assumes for the sake of discussion that some of these claims are valid, at least on refuge lands, a host of management

questions arise, none of which are identified. For example, we believe that the State will likely assert that USFWS can have no say in the management of "their" rights-of-way absent a specific grant by the State; a snowmobile trail in 1985 may not present management problems for USFWS today but State expansion of the same corridor in 2005 to a year round highway will likely be troublesome, at best. Likewise, Section 17(b) easements on native lands allow certain defined uses. As noted earlier, some of the State's R.S. 2477 assertions cross refuge lands, connect with Section 17(b) easements on native lands, and, in some situations, continue on across other refuge lands. We thus see a need to work with USFWS to develop a coordinated policy which addresses R.S. 2477 rights-of-way claims that potentially impact both refuge and native lands. We would like to see just such a commitment in the final plan.

340

9 We also believe that USFWS's failure to fully assess, in detail, the issues surrounding the R.S. 2477 question, at least with respect to its own lands, is a major deficiency in the draft plan. For example, USFWS's preferred alternative plan, Plan D, places large portions of the refuge in a minimal management category; so do Plans A and E and, to lesser degree, Plan C. Several of the State claimed rights-of-way cross these minimal management areas. Yet, according to the draft plan, at pages 115 and 120, improved roads will not be allowed in minimal management areas. The State may choose to ignore your management plan. This is just one of many R.S. 2477 conflicts which could develop

in the near term. More work needs to be done.

THE PREFERRED ALTERNATIVE PLAN

Before directly commenting on USFWS's preferred alternative management plan, Doyon notes that it supports Alternative A, with one major qualification. With a similar qualification, Doyon could support Plan D, the preferred alternative of USFWS.

In our view there is only one material difference between Alternative A and Alternative D. Alternative D proposes to recommend a written designation of approximately 650,000 acres along the southern tier of the refuge in the White/Crazy Mountains area. Both plans would otherwise maintain current conditions and place substantial portions of the refuge in minimal management categories. Both plans note that there would be negligible impact on wildlife, habitat and local residents through implementation of either plan.

10 Doyon's major concern with both plans involves, once again, the issue of each inholder's guaranteed access rights for all purposes, including economic development. We shall not reiterate all of the points made earlier on this issue. We do emphasize, however, that the existing rights confirmed in Section 1109 of ANILCA and those supplemental rights granted under Section 1110(a) and (b) must be recognized. Under these provisions, the refuge compatibility test[8/] used in most national wildlife

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[8/] See, 16 USC § 668dd.

10 refuges is inapplicable to access by certain persons and inholders in Alaska refuges.[9]

The legislative history of Section 1110(a) clearly supports this position.

> The Committee amendment guarantees access subject to reasonable regulation by the Secretary on conservation system units, National Recreation Areas and National Conservation Areas, for traditional or customary activities such as subsistence and sport hunting, fishing, berrypicking, and travel between villages.
>
> The Committee recommends that traditional uses be allowed to continue in those areas where such activities are allowed. This is not a wilderness type pre-existing use test. Rather, if uses were generally occurring in the area prior to its designation, those uses shall be allowed to continue and no proof of pre-existing use will be required.

S.Rep. 96-413, Nov. 14, 1979, p. 248.

Thus, it should be clear that there is no refuge compatibility or specific pre-existing test with respect to the above-quoted activities.[10] Nevertheless, when discussing wilderness and minimal management areas, the plan at page 139 notes:

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[9] Both subsections of Section 1110 of ANILCA begin with the phrase "[n]otwithstanding any other provision(s) of this Act or other law ...". Compare Section 1110 with Section 304(b) of ANILCA.

[10] Also, Section 811 of ANILCA, which addresses subsistence access, must be read together with Section 1110(a). Many of the access uses described in Section 1110(a) are similar or identical to the types of subsistence access uses protected in Section 811. Subsistence is one of the purposes for which the Yukon Flats NWR was established, Section 302(9)(B)(iii), and thus are per se compatible with refuge purposes irrespective of Section 1110(a).

11

> Traditional means of access, subsistence use, and other activities that took place before the passage of ANILCA will be permitted if they are compatible with refuge purposes as defined in ANILCA.

This is a clear misapplication of Section 1110(a) that must be corrected in the final plan.

Similarly, and even more forcefully, Section 1110(b) of ANILCA sets forth the sole test for granting access across refuge lands to and from inholdings for all purposes, including economic ones. We have already discussed this aspect of access in detail at pages 4-8 of this letter.

Additionally, Section 1109 of ANILCA affirms existing rights of access. Inholders within the Yukon Flats NWR predated the establishment of the refuge. All common law, statutory, and constitutional rights of access to these properties were specifically honored and preserved through Section 1109 of ANILCA.

The Secretary may reasonably regulate but cannot deny access. Compatibility is not the test. Compatibility is only a factor to be considered in regulating such uses.

In sum, a clear recognition of access rights is central to Doyon's support of either Plan A or Plan D. Furthermore, the degree of clarity with which USFWS deals with access as it potentially affects Doyon under Plan D is also of utmost importance to Doyon. Specifically, it must be recognized that irrespective of a wilderness designation in Plan D, Doyon and others have a right of access across that area and all other refuge lands for all

purposes. With such specific recognition, we could support USFWS's preferred alternative.[11/]

ADVISORY COUNCIL

We suggest that, because of the significant size and number of inholdings lying within the boundaries of the Yukon Flats NWR, it would be appropriate for USFWS, in concert with the inholders, to organize, develop and utilize an informal advisory council of inholders. We believe that an advisory council together with the use of cooperative management agreements would greatly assist USFWS in its efforts to preserve and enhance fish and game habitat and lead to a better working relationship among and between all interests.

ADMINISTRATIVE SITE AND VISITOR FACILITIES

12 Section 1306 of ANILCA creates a preference for location of administrative sites and visitor facilities on native lands. Furthermore, a preference is established for local residents and native corporations under Section 1307 of ANILCA in selecting persons to provide most types of revenue producing visitor facilities and activities. The draft plan fails to incorporate these important requirements.

11/ We note that it may be legally impermissible at this time to make a wilderness designation since inholder access issues and their potential effects on proposed wilderness areas have not been assessed. See, ANILCA, Section 304(g)(2)(D). Also, wilderness designation seems inappropriate since ANILCA's Section 1008 assessment is not complete. See also, ANILCA, Sections 304(g)(2)(B) and (D) and 304(g)(3)(A).

CONCLUSION

Finally, we note that while final management regulations will not be applicable to the real property interests of inholders,[12/] we reiterate that many of our goals and the goals of our shareholders are consistent with the management goals of USFWS. It is in the spirit of much needed cooperation between Doyon and USFWS that we have offered our comments and look forward to working with you in the future to accomplish those mutual goals.

Sincerely,

Jim Mery

for Morris Thompson
President and Chief Executive Officer

12/ See, ANILCA Sections 103(c), 1301, and S.Rep. 96-413, Nov. 14, 1979, p. 303.

Response to Doyon, Limited.

1. The Service is aware of the importance and significance of archeological, cultural, and historic sites on the refuge to the local residents and recognizes their special value to the local residents. The Service will make every effort possible to protect all such sites on the refuge in accordance with federal and state law. The Service does not, however, feel that these sites would constitute a "special value" in the sense of warranting designation as a national historic landmark or historic place. These sites, therefore, have not been identified as a special value in that section of the plan.

   The Service would agree that the research thus far conducted is not adequate. As stated in the Management Alternatives section of the plan, "inventory and evaluation of cultural resources on the refuge will continue as funding permits (as directed by the 1980 amendments to the National Historic Preservation Act)." Due to a limited budget, such work is not progressing as rapidly as the Service would like.

   The Service is aware of the references you mention as well as others not identified in the bibliography.

2. The Service recognizes your concerns relative to the discussion of access to refuge inholdings. Additional discussion of Title XI has been added to the final Yukon Flats Plan. Hopefully, this additional discussion will alleviate the concerns you have expressed.

   While preparing the Comprehensive Conservation Plan for the Yukon Flats Refuge, members of the planning team have met with the residents of all the local communities, including meeting with representatives of the village corporations, on several occasions. Through these meetings and other contacts with local residents, the Service has not been made aware of any immediate plans for economic development of private inholding within or adjacent to the Yukon Flats Refuge. We are aware that, at some time in the future, such development may occur. For example, commercial timber harvest has been discussed as a potential economic activity on lands around Fort Yukon at some future time. In addition to the assurances under Title XI of ANILCA, the preferred alternative maintains the flexibility necessary to accommodate economic development on private inholdings through future revisions of the plan.

3. Your concerns have been noted. The discussion of subsistence use of the refuge in the Significant Problems chapter of the plan has been deleted.

4. See response 3 above.

5. See response 3 above.

6. See response 3 above.

7. You are correct. The plan has been revised to allow agricultural development on those areas of the refuge in the intensive management category in response to Section 1324 of ANILCA. Agricultural development may be permitted in these areas based on a case-by-case compatibility determination. Agricultural development would not be permitted in areas of the refuge under moderate or minimal management as agricultural development is inappropriate when considering the management intent of these categories. Much of the privately held land within the refuge is suitable for agricultural development and, because of its proximity to the local communities, would more probably be developed if agricultural development is found to be economically feasible.

8. The draft plan states, "Private lands within or adjacent to the refuge and special value refuge lands will receive the maximum protection practicable from fire." Private inholders (Native regional and village corporations) were involved in the preparation of the Upper Yukon/Tanana Fire Management Plan. Buffer zones were established around Native inholding as a result of their input into the planning process.

9. Valid existing rights, which would include valid RS 2477 rights-of-way, would be honored regardless of the management plan adopted or the management category in which the "rights" exist. Section 1109 of ANILCA states that "Nothing in this title shall be construed to adversely affect any valid existing right of access." Such rights shall be subject to reasonable regulations issued by the Secretary to protect the natural and other values of such lands. In addition to the assurances under Title XI of ANILCA, the preferred alternative maintains the flexibility necessary to accommodate such development actions through future revisions of the plan.

   Since none of the potential RS 2477 rights-of-way have been adjudicated, the Service sees no need to assess the potential impacts of development at this time. Should any of the RS 2477 rights-of-way be validated and proposals be made for road construction, then an assessment of impacts would be undertaken by the Service and reasonable regulations would be issued.

10. The Service recognizes that valid existing rights of access, as discussed under Sections 1109 and 1110 of ANILCA, are not subject to refuge compatibility determinations. Access routes are allowed through wilderness areas, though Congressional approval is necessary. In the case of new wilderness areas, the enabling legislation can recognize future needs for access (including transmission lines and power lines), writing specific clauses into the legislation covering the future development of such facilities into or across wilderness areas.

11. This section has been modified in the final plan to reflect the wording of Section 1110(a) of ANILCA. Valid existing rights of access under Sections 1109 and 1110(b) also are not subject to compatibility determinations.

12. A discussion of administrative sites and visitor facilities, specifically discussing the application of Sections 1306 and 1307 of ANILCA, has been added to the Common Management portion of the Management Alternatives section of the final plan.

Tanana Chiefs Conference, Inc.
201 First Ave.
Fairbanks, Alaska 99701
(907) 452-8251

February 20, 1986

Mr. Norm Olsen
U.S. Fish & Wildlife Service
1011 E. Tudor Road
Anchorage, AK 99503

RE: Corrected Comments

Dear Norm:

Enclosed please find a corrected set of comments on the Yukon Flats National Wildlife Refuge Draft Plan plus an enclosure. You should have received our comments Friday the 15th. As I indicated to you on the phone, that first set had typos and I had forgotten the enclosure referenced in the comments. This second set has the corrections and the missing enclosure. Please discard the first uncorrected set of comments and put these in its place.

Also, with reference to BLM/FWS and Birch Creek, I plan to send you a copy of the compliant recently filed against BLM in court that outlines their failure to implement their own existing regulations concerning plans of operations and reclamation for placer mine sites. As you will see, they are highly negligent, particularly on Birch Creek. The suit is very similar to the one filed against the NPS last year, which was successful, and is a good suit. The point in sending it will be to make the point that FWS is in a very good position to ask BLM to shape up and tighten up on Birch Creek and to note that as a part of the final draft. Please give it some thought.

I hope our comments are useful.

Sincerely,

TANANA CHIEFS CONFERENCE, INC.

Jim Kowalsky
Wildlife & Parks

JK:de

Enclosures

Comments On

Yukon Flats National Wilderness Refuge Draft
Comprehensive Conservation Plan;
Environmental Impact Statement and Wilderness Review

Analysis by Page

1 X -under planning process an issue of public concern that should be identified is predator control.

XII -ensuring subsistence - should include conflict resolution and land exchanges.

2 XVII -ecomonic conditions - speaks to cash economy and thus fails to recognize that subsistence is an economic activity and comprises a part of a singular mixed rural, subsistence-based economic system; the entire draft clearly presents this erroneous bias. This point is particularly well made in a recent paper (copy enclosed) by Robert Wolfe and Robert Walker entitled "Subsistence Economies in Alaska: Productivity, Geography, and Development Impacts" presented December 7, 1985 in Washington, D.C. at the symposium "Modern Hunting and Fishing Adaption in Northern North America" at the 84th meeting of the American Anthropological Association, Washington, D.C.. The paper makes a compelling case-using harvest data collected from 84 rural Alaska communities-for consideration of rural subsistence activities as a productive sector of Alaska economy. We strongl feel that this bias must be corrected in the final draft so as to treat subsistenc properly. No other approach will provide the reader with the correct perceptions about subsistence, surely not the one used in the draft.

As the development of the cash economy impacts upon the subsistence-based economy, the impacts may not necessarily be positive, or they might be depending upon compatibility of the former if it compliments the harvest of wild food resources. The draft never reflects these possibilities because it inherently mis-represents subsistence as non-economic activity.

XVIII -Management Directions - predator control is obvious by its absence in "Fish and Wildlife". It should be discussed.

XVIII Water Quality - we want to see plans for improving water quality of Birch Creek, not just see "no appreciable change". To approach this problem cooperatively with

BLM is so obvious, yet nothing in this plan suggests any approach. We sense that FWS does not even discuss Birch Creek with BLM with an eye toward improvement.

3 XVIII Management Costs - no discussion of congressional intent for local hire found in ANILCA and relevant legislative history. Our view is that FWS actually is avoiding the local hire mandate and discussion of it. It is specific and should not be difficult to understand.

4 XIX Social Conditions and Economic Conditions - again, subsistence is treated incorrectly as non-economic, "lifestyle" phenomena.

XX Public Use Management - we do not support unrestricted use of aircraft on the refuge. Our concerns reflect strong similar views held by local residents deriving from the competition hunters and trappers who access resources by use of aircraft pose for local subsistence users.

5 XX Section 810 - we disagree with the draft statement that disclaims significant subsistence impacts to result from alternative D for reasons already stated (aircraft use, water quality). A summary of research by Dr. Jackie La Perrier is attached that speaks to the impact of poor water quality on fish in Birch Creek for example. Also, oil and gas exploration ultimately in its intended purpose to find and produce oil and gas-most likely could significantly impact subsistence. Although we do not in any of these comments directly represent communities on the Yukon Flats, we do note that it is important to understand that little or no support for oil development (the ultimate purpose of exploration on refuge lands) exists among many or most local people, and in fact, there is known opposition to it locally. Although TCC takes no particular point of view for or against such development at this point, we note that oil or gas exploration leading to development will most certainly impact subsistence significantly. Such impact might be positive if there is compatibility or if oil related employment could actually compliment the subsistence-based economy without damaging it. These are concerns that must be noted and measured in a way that does not leave the matter in neutral status in the final. There is, of course, a strong

5 possibility that such development will restrict subsistence uses.

p3 Suppliment to the Draft-again, our comments elsewhere regarding economic conditions and the way it is treated of course apply with equal force with respect to the suppliment and any final.

6 17 Significant Problems-here, most regrettable of any reservations, criticisms and regrets that we have regarding this draft, we object most strenuously to the perception that "subsistence users" are seen as a problem rather than an opportunity to build effective, efficient management through strong local supportive attitudes and actions for subsistence and on behalf of such users; please note subsistence is a productive economic sector, not to mention the stated intent of congress to provide for and protect subsistence. It is too tempting here to not reverse the situation. Local people can and do see the refuge as "a problem" and they do see the lifestyle of the dominent society that represents the FWS and its non-local constituency as "the problem." We view the bias of the approach as damaging, non-productive and one that will result in poor relations and ineffective refuge programs.

7 17 Also, "-Subsistence is basically a state issue-" No! No! No! How completely erroneous, how totally the FWS ignores the federal oversight, the relief, nay--the present situation in fact! Presently, the state fails to protect a local rural priority for the taking of subsistence moose.

17 Also, "The proximity, size of local residents' private holdings--raise the questions of who, if anyone (emphasis added), has exclusive rights to use the resources on refuge lands." This statement is vague charitably speaking, and outrageous if given another reading. What is it intended to say? What relevance does any FWS attitude implied therein have to the clearly stated subsistence mandates found in ANILCA?

8 18/19 We hope to see an accurate description of native allotments in the final (also see pp. 27 and 135 - the discussions here do not meet this need either). Native allotments are special status lands held in trust. The reader needs to be educated. Allotments are not merely inholdings.

9 | 19 Development of Adjacent Lands - we were surprised to see no mention of plans to specifically work cooperatively with BLM on "Off-Refuge Placer Mining--" to at least begin to try to work on solutions to the water quality problems thus created. How can the FWS possibly portray its efforts to meet the water quality requirements of ANILCA and not make such cooperative plans. This omission truly baffles us.

21 -Again, here, BLM is even referenced with not even a suggestion that FWS must seriously consider cooperative BLM/FWS strategies to clean up Birch Creek.

10 | 22 "--recycle capibilities--are expensive and, therefore, economically unfeasible (emphasis added)--" there is a need to document this assertion.

22 -Difficulties in Managing the Refuge - we wholeheartedly support the thrust of this discussion, namely that FWS is a distant, absentee landlord/manager. it is difficult for us to conceive how this refuge could ever be effectively managed from Fairbanks. Local hire and presence of staff stationed on the refuge would help in our view. A positive relationship between FWS and local people could be built as a result of such actions, if properly implemented, resulting in a far more effective and efficient management which could be built upon local cooperation. This presently is noticeably not happening on the flats. However, in reflecting our constituents' requently stated concerns and ideas about effective refuge management, we want to go one large step further and ask that the FWS and the Secretary consider contracting the management of this refuge to a tribally owned, or ANCSA corporation. An earlier paper addressing this idea in concept is attached. Although such would represent a large departure from the traditional refuge/FWS arrangement, we believe that a thoroughly professional and effective management of this refuge could be achieved in this manner and at significantly less cost to the federal government. The final should asses this possibility in our view.

11 | 27 Native allotments need a thorough and historically correct description under Land Status.

12 | 44-47 Water Quality-"--problems not well documented--". There is new evidence in a three year study by Dr. Jackied Le Perriere that involves fish productivity as impacted by placer mining water quality problems on Birch Creek (a copy of a summary news release detailing some of her study results is enclosed).

101/102 Economic Use-Other uses this discussion is flawed for reasons stated earlier concerning the incorrect bias of this plan, ie: that subsistence is something other than economic activity.

Our remaining comments are summary in nature:
Alternative D seems generally a suitable alternative taking into consideration the comments and concerns we have heard over the years from local resident Native people of the Yukon Flats. Although our comments do not represent specific local communities, the comments do generally reflect such local views as those have been made known to us.

Wilderness and Access - local residents seem to prefer wilderness status as proposed in alternative D. That is, along the southern boundary of the refuge. There also may be some support expressed in Stevens Village for wilderness status for some of the Dall River watershed. We do have serious concerns about FWS applying a "compatibility test" for access to allotments within both wilderness areas and within the refuge generally. Our understand is that such inholders shall have access, unequivical access, not subject to arbitrary tests and measures, none of which are defined or discussed in this plan.

We have observed over the years that many local residents of the area do not favor development of public surface access (roads particularly), especially because of concerns for "opening up" the country to non-local use (in fact, the Wolfe/Walker paper cited earlier in our comments presents verifiable data, and makes conclusions from those data, that road connected communities do experience a decline in the subsistence base and activity of those communities).

Notwithstanding this observed concern, the access provisions in ANILCA and the supporting legislative history is what it is, and says what it says. We hope the final draft evaluates this situation more thoroughly. Our concern is primarily for maintenance of the subsistence-based economic activity for the Flats, which we deem to be very substantial. 13

RS 2477

We have concerns about RS 2477 rights-of-ways. Stevens Village does not believe that this right-of-way, also described as the Hickle Highway is valid. We believe that RS 2477 claims are not valid and cannot exist on Native lands.

Advisory Committee

At the regional village meeting held in December in Fort Yukon, formation of a refuge local advisory committee was suggested. We support this idea and wish to see discussion of this possibility in the final.

In conclusion, although we have made a number of strong criticisms of some elements of the draft, it is generally a well documented and conceived plan; contrasted with another for the Tetlin Refuge, it is superior and sets some desireable standards for such plans.

We hope that these comments will both emphasize a point of view based we believe, in fact, and that these comments will be useful and helpful in preparing a final draft.

Response to Tanana Chiefs Conference, Inc.

1. Predator control was not included in the list of issues of public concern in the draft plan as it was not identified as an issue during the public scoping process in the fall of 1982. Since scoping occurred, predator control (population control) has become a significant issue in the State of Alaska. Additional information regarding the Service's policy on predator control on the Yukon Flats National Wildlife Refuge has been incorporated into the final plan.

2. The Service does recognize the importance of subsistence to the rural economic system. The draft plan discussed the importance of subsistence to the economy of the region under Sociocultural Systems (p. 76-78) and Economic Conditions (p. 79-80) in the Affected Environment section. Additional information has been added to these discussions in the final plan. The discussion of subsistence which was included under Public Use in the draft plan has been included as a separate section in the final plan, immediately following the section on Economic Conditions.

3. It was not the intent of the Service to avoid the local hire issue. A discussion of local hire (Section 1308 of ANILCA) and administrative sites, visitor facilities, and visitor services (Sections 1306 and 1307 of ANILCA) has been added to the Management Alternatives chapter (under Common Management) in the final plan.

4. See response 2 above.

5. We do not believe that the current level of subsistence opportunities on the refuge would be significantly affected by the implementation of Alternative D. We recognize that impacts from aircraft use on the refuge (which was occurring prior to designation of the area as a National Wildlife Refuge) and the impacts of placer mining on water quality in Birch Creek may be affecting subsistence activities on the refuge. Under all the alternatives, the Service will pursue a cooperative solution (with the Bureau of Land Management, Environmental Protection Agency, and the State Department of Environmental Conservation) to the water quality problems associated with placer mining on Birch Creek.

   No oil and gas leasing would be allowed under Alternative D, the Service's preferred alternative. Oil and gas exploration, including seismic activities, would be allowed. The Service does not believe that these activities would adversely affect subsistence activities. Project-specific Section 810 evaluation will be done prior to allowing these activities.

6. Your concern has been noted. This discussion has been deleted from the final plan.

7. Your concern has been noted. This discussion has been deleted from the final plan.

8. Additional discussion of Native allotments has been added to the final plan.

9. Discussion of the need for a cooperative effort relative to Birch Creek water quality between the Fish and Wildlife Service, the Bureau of Land Management, the Environmental Protection Agency, and the Alaska Department of Environmental Conservation is included in the Common Management discussion of Water Quality (Management Alternatives chapter) in the draft plan. Discussion of this cooperative effort has been added to the Significant Problems chapter - under Development and Use of Adjacent Lands and Water Pollution Problems on Birch Creek - in the final plan.

10. This statement has been deleted from the final plan.

11. Additional discussion of Native allotments has been added.

12. Current information from studies of Birch Creek being done by Jackie LaPerriere and others at the Alaska Cooperative Fishery Research Unit at the University of Alaska-Fairbanks has been added to the final plan.

13. Access to the refuge for traditional activities and for travel to and from villages and homesites is ensured under Section 1110(a) of ANILCA, access to private lands (including subsurface rights), valid mining claims, and other valid occupancy is ensured under Section 1110(b), and access for subsistence is ensured under Section 811. An expanded discussion of the access provisions of ANILCA has been included in the final plan.

Dinyee
[illegible] 2nd Avenue
Fairbanks, AK 99701-1909

January 27, 1986

Regional Director
(Attention Bill Knauer)
Fish and Wildlife Service
1011 E. Tudor Rd.
Anchorage, AK 99503

Dear Mr Knauer:

We are writing to give comments on the Yukon Flats draft Comprehensive Conservation Plan/Environmental Impact Statement and Wilderness Review. To begin with, we can not over-emphasize the importance of the subsistence economy to the local people in Stevens Village. Subsistence use is not a problem that could affect fish and wildlife resources. Subsistence use has been around for a long time on the Yukon
1 Flats. It is a natural part of the Flats. Subsistence is not basically a State of Alaska issue as is stated in the plan, but it is one of the purposes of the Refuge. It is not a problem, but an opportunity to provide for the continuing existence of the people in the Yukon Flats. To deny them their subsistence rights would
2 have a genocidal affect. Contrary to what is stated in the plan on page 77, the cash economy is not necessarily preferred over subsistence. Subsistence is the basis of the economy in the Flats. Local hire has to continue there. Please don't let outsiders take their subsistence jobs away. More study is needed on airplane hunters from outside in the Flats. The local people report that there are many of these. We know that a study will be hard to do since most of the airplane hunters are illegal hunters in the first place who just shoot whatever they see whenever they see it.

The area of the Yukon Flats that Stevens Village people have used, occupied, and governed (principally the Dall and Little Dall River watersheds) is Indian Country. One of the Resolutions out of the Tanana Chiefs Conference last year was a declaration that the Yukon Flats is Indian Country. Dinyee and the tribal council of the Native Village of Stevens have both declared the lands that the Stevens Village people use, occupy, and govern to be Indian Country. We would like to see a local advisory committee of local people and land owners set up for the Flats. This would insure more local input into refuge management. This committee can work on a process to move the refuge headquarters to the Flats and begin to work on a plan to "privatize" the refuge management. Right now FWS personnel and the local people are not relating very well. The best way for the refuge to work is for the local people to manage it. They are qualified and need the work. The local people have a tremendous amount of knowledge about the land and animals. This knowledge should not be lost. It should be incorporated into the refuge management. The Yukon Flats region is the most economically depressed in Alaska and the United States. With the refuge headquarters in the Flats some jobs will be created for the local people. The people need to know what is happening A newsletter is needed at least on a quarterly basis. We've had surprises such as the recent oil and gas emphasis in the management plan and the fact that ARCO was flying magnetic surveys on the Flats without our knowledge. We need to be kept informed about what is going on in areas such as Special Use Permits which the FWS issues, etc.

Private inholdings are not the problem which the plan makes them out to be. The local people have a far better track record of protecting the land and animals than the FWS does. Also, as we see from the new oil and gas policy, development is more likely to occur on the refuge lands than on the private land in the Flats.

We are concerned about the toxic pollution being poured into the food chain from the mining operations along Birch Creek We are concerned about the danger to the fish populations caused by the dirty water What is going to be done about this? How can future oil and gas development be made compatible with the refuge purposes when this running sore is allowed to continue to infect everything with it's poison? FWS needs to do something about this to have any credibility in the area of making oil and gas development compatible with the refuge purposes.

In the area of management of migratory fish, the FWS needs to lobby hard in the national and international arena for the proper escapement of fish returning to the Yukon River watershed located in the Flats The high seas Japanese harvest and the incidental harvest in Bristol Bay have to be the subject of FWS efforts to protect the fishery

3 On page 76 there are errors in the population table for Stevens Village The 64% figure for the Indian population of Stevens is obviously wrong

We are opposed to the acknowledgement and/or placing of so-called RS 2477 rights of ways in the final plan or status map of the refuge The Hickel Highway is a good example of the injustice of RS 2477 The Hickel Highway was illegal in the first place and was an insult and injury to the land and the people of Stevens Village (please refer to the enclosed resolution) Never again! There is no future need for the Hickel Highway 17(b) easements are sufficient for access across the private inholdings within the refuge

4 On page 101 is the statement that the "primary benefits of waterfowl production on the Yukon Flats Refuge occur chiefly in other regions of North America where sport hunters take many waterfowl reared on the Flats" This is not true the waterfowl have a right themselves to exist seperate from being prey for sport hunters

We would strongly urge and plead with FWS to close by regulation the Dall River's watershed to [illegible] by float planes. They ruin the solitude of the area by continuously buzzing around They are taking valuable subsistence jobs away from the local

people, many of whom are too old to be re-trained for different jobs. Continuing opportunities for subsistence for Stevens Village people can't be maintained, which is one of the refuge's purposes, as long as the float planes continue their unbridled dominance of the land within the Dall Rivers watershed Airplanes in general need sky highways to stay on in the Flats Please develop regulations for this We have enough problems with snowmachiners coming over from the haul road trespassing on trap lines and taking away subsistence jobs. FWS needs to monitor this.

Under the table listing activities on the refuge on page 114 and 115 we seriously question the need for chemical fish habitat manipulation, public safety cabins, and special permit cabins except for trapping only. Other special permit cabins may compete with the private inholders ability to provide services to the tourism industry. Again the local people are the most impoverished people in the United States. Please allow for ways for them to survive economically.

At this time FWS does not need to spend any of it's limited budget on promoting visitors to the Flats. The private sector can take care of this if there is a need.

We support FWS in choosing Alternative D as the preferred management alternative. You have done a good job on that. We would add that you recommend the Dall Rivers watershed for wilderness designation. It meets all of the criteria for wilderness. This land needs to be protected to the maximum extent possible as this is a unique ecosystem that has not been impacted by industrialization yet.

We are concerned about the FWS's hasty restatement of FWS policy on oil and gas exploration and leasing on the Flats. We want to make sure that the so-called "national interest" does not override compatibilty with refuge purposes such as the continuance of subsistence opportunities for the local residents. Without the continuance of the subsistence opportunities in the Flats the local people can't survive and as a culture they will be

[illegible] Any [illegible] the Flats should be done by [illegible] village corporations and [illegible] should be mandated. The local people will support and [illegible] FWS better if FWS is sensitive to their local hire needs. In the area of oil and gas exploration how can we have exploration and then not have development following if oil and gas is found. Roads are the one aspect about oil and gas development that the local people fear the most. Creative ways need to be found to prevent roads being built in the Flats. The people in Stevens Village have seen only negative impacts from the millions of dollars worth of oil related development in their area. Why would the oil companies want to change their take the billion in profits and run attitude? What is there for the local people in oil and gas development except for more negative impacts.

Thank you very much for your time and consideration in this matter. Let us know if we can clarify our comments further.

Cordially,

Dave Lacey

Dave Lacey
General Manager
Dinyee

Response to Dinyee.

1. We agree. The Fish and Wildlife Service has always recognized its responsibilities under Title VIII of ANILCA. The provision of the opportunity for continued subsistence use by local residents is one of the purposes of the refuge. This section of the draft plan has been deleted from the final.

2. Your concerns are noted. The sentence you refer to has been deleted from the final plan.

3. We agree that the 64% figure for the Native population of Stevens Village is probably incorrect. A footnote has been added to Table 11 which recognizes your concern. However, the percentage was derived from figures in the 1980 census. They came from: Table 55. General Characteristics for the Total and American Indian, Eskimo, and Aleut Persons on Reservations and Alaska Native Villages: 1980. From:

   U.S. Department of Commerce, Bureau of the Census. 1982. 1980 Census of Population, Vol. 1. Characteristics of the Population. Chapter B - General Population Characteristics. Part 3 - Alaska. PC 80-1-B3.

4. We agree. The statement has been deleted from the final plan.

December 18, 1985

U.S. Fish & Wildlife Service
Region 7
1011 East Tuder Road
Anchorage, Alaska 99503

RE: Comments on Yukon Flats National Wildlife Refuge Comprehensive Conservation Plan

Gentlemen:

Our last meeting was held in Fort Yukon on December 15, 1985 to solicite comments for the above plan. At that meeting, our village selected Management Plan Alternative D. Further comments on Alternative D: the need for local residents to be involved in refuge management, and on the State's Position Paper are the subjects of this letter.

As shown by the attached resolution, we substantially agree with Management Plan Alternative D, and therefore favor minimal management policy. We agree with the following management directives of Alternative D:

A. oppose non-renewable resource development

B. favor minimal public disturbance of the wildlife.

C. favor protection of our subsistence tradition.

D. favor the White Mountain Wilderness Area, but disagree with designation of any additional land as wilderness.

1 Our only disagreement with Alternative D is that it doesn't permit the harvesting of timber for houselogs and firewood along the Birch Creek River. We feel that action should be initiated to allow the continued use of the timber resources for houselogs and firewood for local use.

The next comment concerns a recognized need for local residents to be involved in the management of the refuge for the following reasons:

A. The Service has a large land area to manage and local involvment is the best method to be utilized for efficient management.

B. The Service requires a close liaison with the local residents to avoid potential conflicts caused by communication barriers and inadequate involvement.

C. The key to good management is adequate data collection and local residents are qualified to collect data concerning fish and wildlife.

D. We, as a people, have lived here for thousands of years, and have developed a rich tradition of respect for wildlife.

For example, Lawrence Martin, a life-long resident of Birch Creek was employed by the Federal Fish & Game Department the summers of 1981, 1982, and 1983 to collect wildlife population data. He was employed 40 hours a week to collect data. He was not rehired in 1984 because of Federal budget cuts. He provided a more direct communication link with the Federal Fish & Game Department.

Our village would be deeply interested in land and resource management contracting to become more self-sufficient with respect to our lands and refuge land that borders our lands.

Our last comment is on the State of Alaska Position Paper. The State is requesting F & W Service cooperation in designing and implementing a HARVEST MONITORING SYSTEM capable of providing accurate subsistence data. Our feeling is that to accomplish this goal, the F & W Service should employ local residents to manage the refuge and our own subsistence activities.

In conclusion, our priorities are:

good management of wildlife on the refuge,
the preservation of subsistence activities,
and
the development of a better communication link between the:
U.S. Fish & Wildlife Service
and
the local residents.

We appreciate this opportunity to comment on the YUKON FLATS REFUGE MANAGEMENT PLAN and hope our comments will help in developing an efficient, comprehensives management plan.

Answers or questions may be directed at Duane James, a council member who attended the meeting and did this report.

Sincerely,

BIRCH CREEK VILLAGE COUNCIL

SRJ:dj

Duane James
member

Winston James
President

Susan James
Vice-President

Jeannette Baker
Secretary/Treasurer

David James
Honorary Chief

Lawrence Martin
Member

Randall Baalam
Member

cc: Steve Ginnis, Fort Yukon, AK
cc: Clarence Alexander, Fort Yukon, AK
cc: Will Mayo, Liaison, Tanana Chiefs Conference, Fairbanks, AK

BIRCH CREEK VILLAGE COUNCIL

RESOLUTION NO. 85-06

WHEREAS, the Birch Creek Village council recognizes the need to designate a preferred management plan for the Yukon Flats National Wildlife Refuge Comprehensive Conservation Plan;

WHEREAS, the U.S. Fish &Wildlife Service has prepared a draft plan for the YUKON FLATS NATIONAL WILDLIFE REFUGE;

WHEREAS, the residents of Birch Creek Village are directly impacted by the future management plan for the Yukon Flats National Wildlife Refuge;

NOW THEREFORE BE IT RESOLVED, that the Birch Creek Village Council approves the Yukon Flats National Wildlife Refuge Management Plan Alternative D, except for the section that prohibits the harvesting of timber for houselogs or firewood.

ADOPTED AND DATED this 18th day of December, 1985, at Birch Creek, Alaska.

Jeannette Baker
Jeannette Baker
Secretary/Treasurer

ATTEST BY: Susan James
Susan James

Response to Birch Creek Village Council.

1. Only the commercial harvest of timber is prohibited under Alternative D. Harvest of timber for subsistence uses, such as for houselogs and firewood, is permitted throughout the refuge in all management categories under all alternatives.

ALASKA MINERS ASSOCIATION, INC.
509 W. Third Ave., Suite 17, Anchorage, Alaska 99501 (907) 276-0347

Mr. Robert Gilmore, Regional Director
U.S. Fish and Wildlife Service
1011 East Tudor Road
Anchorage, AK 99503

December 11, 1985

Bob

Dear ~~Mr. Gilmore~~:

The Alaska Miners Association, representing the mining and associated industries, appreciates the opportunity to comment on the Draft Yukon Flats Wildlife Refuge Plan.

Although the plan is well organized and easy to follow, there are numerous data gaps where quantifiable information would be useful
1 in arriving at decisions. Where this information is not available, the plan assumes a "worst case" scenario and responds accordingly to protect fish and wildlife values. While we recognize this is current procedures under CEQ guidelines, we believe it is inappropriate (for example, page XV states that up to 25% of wetland habitat could be affected under option B. This assumes that every acre open to oil and gas exploration, plus some additional acreage, would be adversely affected. This is obviously not true.). We feel such plans can and should define and include a realistic or probable scenario.

2 There are several statements throughout the draft which refer to ANSCA lands (private lands) intermingled with Refuge lands. The wording of the draft may imply to the uninformed reader that these private lands are included within the refuge. This is, however, precluded by Section 103(c) of ANILCA.

3 The plan does not address the issue of State ownership of lands underneath navigable waters. Legally, the State of Alaska could allow oil and gas leases or mineral extraction on these lands.

4 We believe the plan should reference those laws under which valid existing rights were established (for example, 1906 Native Allotment Act, 1872 Mining Law and the Submerged Lands Act).

5 The plan does not address the possibility of development of oil and gas resources on private intermingled lands where the geologic structure extends under adjacent public lands.

6 Page 19 of the plan expresses concern about access, but the plan does not identify solutions to this problem.

The plan cites statistics showing that 75% of the high waterfowl production areas are in private ownership. This presents an opportunity for innovative resolution of a problem. Perhaps development rights to resources such as oil and gas, timber and minerals on noncritical refuge lands could be trading stock for habitat protection agreements.

The Association is extremely concerned with the water quality data addressed in the plan. We believe there should be continuous sampling (at least weekly) over a 12 month period on each major drainage. This data could then be correlated with mining activity, natural flooding, fish movements and concentrations. We acknowledge your concern about introducing sediment loads into clear streams. We do not believe, however, that the addition of sediment to the Yukon will be of any consequence given its normal sedimentary load.

There is a long history of mining in several tributaries leading into the Refuge. This activity is cyclic and, since the minerals
7 are finite, will not go on forever. Any analysis of mining activities should consider the ability our resources have historically demonstrated to recover over time.

8 We believe the plan should discuss the relationship of active mining claims on Birch Creek to the Refuge. How far upstream are they? Have toxic metals precipitation been identified in the down stream lands of the Refuge as a result of these activities? We believe the conclusions made in the draft can not be supported without factual answers to such questions as these.

9 Page 38 of the plan identifies a number of mining claims by general names of places. Without more specific information, it is impossible to determine if these claims are within the refuge.

10 The discussion of water quality on page 44 would be more useful if chart of graphic data were given to describe water quality fluctuations over a 12 month period.

11 The Association believes the wilderness proposal is ridiculous when viewing the whole area. The refuge includes only the very northern extremities of the White Mountain formation. That formation is a distinct and separate ecosystem from the "Flats" and is the principal area under management by the Bureau of Land Management in the White Mountains National recreation Area Plan. This is exactly the type of uncoordinated management which was to have been prevented by the involvement of a coordinating body - The Alaska Land Use Council. The Fish and Wildlife Service should

11 insure that their plan describes a level of management for the peripheral White Mountains similar to that prescribed for the adjacent BLM lands.

12 Option C would allow oil and gas leasing , but no development. No prudent person or company will invest in exploration without some assurance that, if there is discovery, they will be able to develop and produce the reserves. This proposal should either be made realistic or discarded entirely.

13 Page 179 suggests that areas around some communities would be adversely affected by oil and gas development. This implies that FWS has jurisdiction on these lands. These are mostly private lands owned by Village or Regional Corporations and FWS has no jurisdiction there. The Association also believes that the worst case scenario does not apply here. Throughout Alaska are examples of the impacts of development activities on wildlife populations (Kenai Refuge, North Slope, Palmer Hay Flats, etc). There has not been any documentation of significant damage to wildlife populations in any of those places.

14 We recognize that refuges are closed to the location of new mining claims and that no new information or data will become available through exploration programs. We believe consideration should be given to evaluating the potential of these lands for energy resources and for critical and strategic minerals. We also believe that all existing patented and unpatented claims should be recognized as valid existing rights and operations allowed to continue under the law governing their location. This includes access.

15 The map on page 84 entitled " Geology of the Yukon Flats National Wildlife Refuge" is a very inadequate graphic of the geologic knowledge of the area. Appendix C of the Bibliography lists a number of publications and there is a very brief narrative describing the geology of the area. Geologic information should be a significant part of this plan since it is basic information effecting hydrology, soils, land forms, etc.

We recommend FWS either contract or arrange with USGS for a thorough analysis and description of the geology of the Refuge to supplement the plan and the EIS. The EIS must describe all the resources and natural resources of the area and will be completely inadequate unless more attention is given to geologic information.

Even though the Refuge is not open to mineral location, geologic information will be valuable for planning and management since it provides data affecting soil and site productivity, water quality and land form.

The Alaska Miners Association appreciates the opportunity to make these comments on behalf of our members. We trust they will be of assistance to you.

Sincerely,

ALASKA MINERS ASSOCIATION

James R. Jinks
Executive Director

Response to Alaska Miners Association, Inc.

1. A potential oil and gas development scenario for the refuge is presented under Alternatives B and C (those alternatives which would allow oil and gas leasing) in the Environmental Consequences chapter of the final Yukon Flats plan. This scenario was developed from the scenarios prepared by the Bureau of Land Management in the document "Petroleum Geology of the Yukon Flats National Wildlife Refuge" (Banet 1987). The intent of the scenario is to present a hypothetical depiction of how oil and gas resources might be developed in the future. The scenario is intended only for purposes of analysis and comparison of impacts between the alternatives.

2. We did not intend to imply that private lands are included within the refuge, only that there are private lands (inholdings) within the boundary of the refuge. These lands are not part of the refuge and will not be managed as part of the refuge.

3. The plan does address the issue of State ownership of lands underneath navigable waters (common management direction section of Management Alternatives chapter). You are correct in saying that the State could allow oil and gas leases or mineral extraction on these lands. The Service does, however, have the authority to regulate certain activities on navigable waters which affect refuge lands (to protect adjacent federal property, to protect the use of navigable rivers for fishing, boating, and other recreational uses, or for purposes of conservation).

4. Additional information identifying the laws under which valid existing rights on the refuge were established has been incorporated into the final plan as appropriate.

5. If oil and gas development on private lands is determined (by the BLM) to be resulting in the depletion of oil and gas reserves from adjacent refuge lands (subsurface), then the Service would consider allowing development of these resources on the refuge. However, prior to allowing leasing and development, the Service would first determine whether such development could be carried out in a manner compatible with the purposes for which the refuge was established.

6. An expanded discussion of access and Title XI of ANILCA has been included in the final plan. The specific section of the draft plan you mention here has been deleted from the final plan.

7. We agree with your statements that mining activities are often cyclic and will probably not continue forever. It is true that many of the resources impacted by mining (and other activities) may eventually recover over time (recovery may only occur as a result of reintroduction of species). The length of time necessary for many of these resources to recover is considerably greater than the life of this plan, even if mining were to be stopped immediately. The ability of resources to recover from impacts over time has been noted in the final plan.

8. Additional information on mining activities and their impacts on Birch Creek has been incorporated into the final plan. This information is from recent research studies by Jackie LaPerriere and others at the Alaska Cooperative Fishery Research Unit, University of Alaska-Fairbanks.

9. Additional information on mining claims on the refuge has been incorporated into the document. This information, from Bureau of Land Management records, was current as of May 20, 1987, and shows only four active mining claim case files on record for the refuge (328 files have been closed with all claims voided). No mining claims have been patented on the refuge. The locations of claims from the active case files are depicted on Figure 7.

10. To the best of our knowledge this information is not available.

11. The proposal to designate the White Mountains within the Yukon Flats Refuge is not inconsistent with management of adjacent areas of the White Mountains in the White Mountains National Recreation Area. These lands are managed under the categories of primitive (the management category closest to wilderness management that the BLM is authorized to use) and semi-primitive motorized. Section 1320 of ANILCA exempts the BLM in Alaska from provisions of the wilderness review required by Section 603 of the Federal Land Policy and Management Act (PL 94-579). Section 1320 states that "Notwithstanding any other provision of law, section 603 of the Federal Land Policy and Management Act of 1976 shall not apply to any lands in Alaska." However, the fact that the BLM is not proposing wilderness designation (or placing all adjacent lands in the primitive management category) does not negate the significance of the White Mountains nor is it justification for not proposing the area of the White Mountains within the Yukon Flats Refuge as wilderness.

    The White Mountains are a unique geologic and scenic feature within Alaska and provide habitat for the only known population of Dall sheep in the refuge. Other wildlife, including caribou, moose, grizzly and black bear, wolves, and lynx, are also present in the area. The area is pristine, provides opportunities for primitive recreation and solitude, and meets all the other criteria necessary for designation of the area as wilderness. This proposal remains as part of the Service's Preferred Alternative, Alternative D, in the final plan.

12. Alternative C, as presented in the draft plan, the supplement to the draft plan, and the final plan for the Yukon Flats Refuge, does allow for leasing and development of oil and gas resources on 26 percent of the refuge.

13. The discussion of impacts resulting from oil and gas exploration and development on refuge lands is not intended to imply that the Fish and Wildlife Service has jurisdiction over privately owned lands, only that should such activities be permitted on refuge lands, the potential impacts would likely effect private inholdings and lands adjacent to the refuge.

    We disagree with your statement that there has been no documentation of significant damage to wildlife populations as a result of oil and gas development. Several of the documents referenced in the wildlife section

of the Environmental Consequences chapter are studies which identify impacts to wildlife populations from oil and gas activities on the North Slope. Numerous other studies have documented impacts to wildlife populations as a result of oil and gas development in various areas of Alaska, including the North Slope and the Kenai National Wildlife Refuge.

14. Your statement that "no new information or data will become available through exploration programs" is incorrect. Section 1010 of ANILCA requires the Secretary of the Interior to assess the oil, gas, and other mineral potential on all public lands in the State of Alaska in order to expand the data base with respect to the mineral potential of such lands. This program is an ongoing program which is currently being undertaken throughout Alaska, including on the Yukon Flats Refuge.

    We recognize that all conservation system units established or expanded by ANILCA are subject to valid existing rights at the time the unit was established (including State and private ownership of surface and subsurface rights, valid mining claims, or other valid occupancy). Section 1110(b) of ANILCA guarantees that " . . . the State or private owner or occupier shall be given by the Secretary (of the Interior) such rights as may be necessary to assure adequate and feasible access for economic and other purposes to the concerned land . . . " Mining activities on any valid existing claims will be allowed, subject to reasonable regulation.

15. We disagree with your statement that the geologic map included in the draft plan is an inadequate depiction of the geologic knowledge of the area. The Alaska Field Operations Center of the U.S. Bureau of Mines stated in their comments on the draft plan that the "discussion concerning the aforementioned topics (regional geology and mineral occurrences within the refuge) is very complete and the geologic map provided is very informative."

    We do not feel that it is necessary to have a more thorough analysis and description of the geology of the refuge prepared for this plan or as a supplement for this plan. As you mentioned, a number of publications were utilized in preparing this document. These documents provided an adequate overview of the geology of the area for use in the comprehensive conservation plan. More detailed information is available from the publications identified and from other publications and sources. In addition, information on the geology of the area continues to be gathered, expanding our knowledge of the area. This information will include an assessment of the oil and gas potential of the refuge which is currently being done by the Bureau of Land Management.

Alaska Oil and Gas Association

505 W. Northern Lights Boulevard
Suite 219
Anchorage, Alaska 99503
(907) 272-1481

February 7, 1986

Mr. Bill Knauer
Regional Director
U. S. Fish and Wildlife Service
1011 East Tudor Road
Anchorage, Alaska 99503

Yukon Flats CCP/EIS Wilderness Review and Supplement

Dear Mr. Knauer:

The Alaska Oil and Gas Association (AOGA) is a trade association whose member companies account for the majority of oil and gas production, exploration and transportation activities in Alaska. We appreciate the opportunity to comment on the Yukon Flats CCP/EIS Wilderness Review and Supplement.

We would like to commend the Fish and Wildlife Service on a comprehensive plan that offers reasonable allowances for multiple use of the Yukon Flats region. We are aware of the great amount of time and effort necessary for generating documents such as this. It is our assessment that wildlife resources are well-protected under each of the management alternatives.

Most of the comments here are directed to the Draft Supplement document.

At the outset, we wish to register our strong support for alternative B. That alternative allows access to most of the Yukon Flats sedimentary basin which we believe has sufficient oil and gas possibilities to warrant further investigation. That alternative takes into account the proximity of population centers and their concurrent activities in areas adjacent to those portions of the Refuge proposed for moderate and intensive management. At the same time, the majority of the refuge is still targeted for minimal management. However, we remain concerned with the designation of the narrow strip of land along the southern edge of the Flats as minimal-management. Not only does this area contain an important segment of the sedimentary basin, but it abuts both Federal multiple-use lands and State lands. It would appear logical to designate this strip of land for moderate or intensive management to permit reasonable support facilities should oil and gas production be established in adjacent lands.

1 As stated in the Regional Director's cover letter, the focus of the Draft Supplement is on the impacts of geological/geophysical exploration and leasing. It appears that these impacts have been consistently overstated in this document. Some of the perceived impacts are incorrect because the operations mentioned are no longer in use by the industry. Even more distressing is the failure of the Supplement to acknowledge that there is a comprehensive network of State and Federal regulations which specifically address each of the listed impacts and mandate either mitigation or, in some cases, prohibition of actions creating the impact. In addition, the history of oil and gas exploration and production in Alaska and the experience gained from regulation of operations in the Cook Inlet region, in offshore waters, and in the Arctic seem to be ignored in the discussion of impacts. Consequently, it appears that any compatibility determination of oil and gas operations with the purposes of the Yukon Flats NWR may be unfairly biased by the inaccurate information contained in the Draft Supplement.

The following comments on individual sections of Alternative B of the Supplement are intended to offset the overall impression that significant environmental harm may be expected if Alternative B should be selected.

2 It is assumed throughout the document that leasing is the industry action expected to have the most extensive impact on the environment. A lease is simply a legal document that gives the lessee the right to develop an oil and gas deposit <u>if</u> exploration should prove it to be present in commercial quantities. Millions of acres of Alaska have been leased, but only a very minute percentage of that acreage has been developed.

3 In each alternate, there is an implicit assumption that seismic exploration will require knocking down miles of trees and otherwise wreaking havoc on the native vegetation. In keeping with current seismic activities in other sensitive areas of the state, it is likely that any seismic activity in Yukon Flats would be done in the winter using state of the art techniques such as helicopter-portable equipment, small crews, and air-blasting which leave no discernible marks on the terrain.

4 A long list of potential harmful impacts to waterfowl appears on Page 15, none of which have proven to be a serious problem in the Prudhoe Bay-Kuparuk Development areas. For example, water quality is expected to be degraded by gravel extraction from stream beds and by improper disposal of muds and cuttings. Stream gravel extraction is currently discouraged by State agencies and mud and cuttings disposal is regulated in great detail to avoid such impacts.

5 On Page 16, the sensitivity and intolerance of caribou to disturbance are noted, but no mention is made of the fact that the Central Arctic herd coexists with the Prudhoe Bay and Kuparuk developments and is actually increasing in size.

6 We are told on page 18 that the impacts of oil and gas activity on fisheries could be potentially significant but, again, the listed events are either prohibited or must be mitigated under current regulations. For instance, improper solid waste disposal, disposal of produced salt water, and improper disposal of muds and cuttings are prohibited. None of these activities present significant problems in other producing areas of Alaska.

7 The last full paragraph on Page 18 postulates hastened snow melt and resulting stream erosion because of dust settling on the snow from road and pad use. On the contrary, the earlier melting of dust-covered snow areas should tend to make the overall spring snow melt more gradual and, therefore, less apt to cause sudden rises in stream levels. Furthermore, the areas of significant dust cover usually do not extend more than about 100 meters from a gravel road or pad.

In the same section on Page 18, moderate impacts on water resources are expected from drainages being altered by ice roads. This seems highly unlikely because there is no drainage in the winter and, during the spring thaw, the ice roads melt into the drainage system.

8 Again, on Pages 18-19, concern is expressed that water supplies will be depleted by drilling activities and will result in major impacts on fishery resources. This has not been a significant problem in Alaska to date. There are many sizeable lakes in the Yukon Flats which could provide ample water.

9 On Page 21, a summary statement says that Alternative B could result in major long-term effects on refuge water quality and quantity in localized areas of refuge. We believe this is extremely unlikely, given the nature of exploration and production, and the intimate involvement of the Corps of Engineers, the Environmental Protection Agency, and the U.S. Fish & Wildlife Service.

10 Under "Social Conditions" on Page 25, Alternative B is seen as resulting in "a large number" of seasonal and short-term non-local workers. This could be true if several years of exploratory work should result in a localized development operation, however, the normal exploration phase would intermittently bring in a small number of workers. Camps at drillsites could be almost completely self-contained.

11 On Page 28 under "Cultural Resources," oil and gas activities under Alternative B are seen as potentially damaging to cultural resources and sites. We find it difficult to believe that this could occur especially in light of the USF&WS' expressed intent to avoid or minimize such impacts. Moreover, federal oil and gas leases would likely contain stipulations to protect cultural resources or sites.

We fully agree with the last sentence on Page 34 which states that activities conducted in accordance with regulations and stipulations should result in no significant sacrifices of long-term productivity on the Refuge. In closing, we would again urge that consideration be given to Alternative B, which we believe makes the best and most balanced use of the Yukon Flats region while still preserving the majority of the Refuge in a minimal-management status.

We thank you for the opportunity to present our views and comments on the Yukon Flats Draft CCP/EIS/WR and Supplement documents. We hope to be of some assistance as the plans for Yukon Flats are completed.

Sincerely,

O. K. Gilbreth Jr

for WILLIAM W. HOPKINS
Executive Director

OKG:tp10:1077

Response to the Alaska Oil and Gas Association.

1. Your concerns have been noted. A potential oil and gas development scenario for the refuge is now presented under Alternatives B and C (those alternatives which would allow oil and gas leasing) in the Environmental Consequences chapter of the final Yukon Flats plan. This scenario was developed from the scenarios prepared by the Bureau of Land Management in the document "Petroleum Geology of the Yukon Flats National Wildlife Refuge" (Banet 1987). The intent of the scenario is to present a hypothetical depiction of how oil and gas resources might be developed in the future. The scenario is intended only for purposes of analysis and comparison of impacts between the alternatives.

   The analysis of impacts associated with oil and gas exploration and leasing has been examined in light of your comments (and the development scenario presented) and revisions have been made reflecting the information you provided. In addition, more emphasis has been placed on the mitigation of impacts which may result from oil and gas activities.

2. We agree. However, the lease is the document which permits exploratory drilling and development of oil and gas resources should they be present. In impact analysis, it is assumed that if a lease is issued, exploration and development activities will follow.

3. Your point is noted and the discussion of impacts from seismic activities has been modified to reflect the use of new technologies as well as the techniques already analyzed.

4. We disagree. Oil and gas activities, both exploration and leasing (development), could have significant impacts on various waterfowl species. It is true that some waterfowl species may be less affected by oil and gas activities than others and that regulation of and necessary mitigation applied to these activities may reduce the magnitude and scope of the impacts resulting from them. However, all the impacts to waterfowl discussed in the Environmental Consequences chapter of the plan have been documented and on-going studies indicate that many of these impacts continue to occur, even with regulation and mitigation of oil and gas development. Therefore, the discussion of these impacts has not changed significantly in the final plan.

5. Your statements are true to a point. However, the Prudhoe Bay-Kuparuk area is primarily caribou summer range. The calving grounds (the most critical habitat area for caribou) of the Central Arctic caribou herd are located in the area surrounding Teshekpuk Lake, over 100 miles west of the Prudhoe Bay-Kuparuk development. Impacts of oil and gas development could be significant if such development had occurred closer to the calving grounds. It is also important to note that we do not know what effect the Prudhoe Bay-Kuparuk development (and associated facilities including the "haul" road) has actually had on the Central Arctic herd as there is no method to project the herd's expansion had development not occurred. Because of the proximity of identified calving grounds, wintering areas, and migration routes to the potential areas of oil and gas development on the Yukon Flats Refuge, the impacts will stand as written.

6. We disagree. It is true that many of the activities associated with oil and gas studies and leasing (development) must be mitigated under current regulations. However, on-going studies indicate that impacts are still occurring. Water quality is still being adversely affected by oil and gas development. For example, in the Prudhoe Bay-Kuparuk area discharge of reserve pit fluids (drilling muds, produced salt water, etc.) into wetland tundra continues to affect the water quality of the area - increasing salt levels, increasing heavy metal concentrations, and reducing invertebrate populations. These types of water quality impacts, if introduced into waters with fishery resources, would have significant adverse impacts to the fishery resources. Figures supplied to the Alaska Department of Environmental Conservation by ARCO and SOHIO show that in 1984, some 57 million gallons of reserve pit fluids were discharged directly from reserve pits onto the tundra with nearly 34 million gallons discharged onto roads (draining through the gravel roads onto the surrounding tundra). In 1985, over 32 million gallons were discharged directly to the tundra and nearly 62 million gallons were discharged onto roads. With similar rates of precipitation occurring on the Yukon Flats as in the Prudhoe Bay area, discharge of reserve pit fluids would be expected if development occurs - the amount of such discharge being dependent on the size and extent of the development.

7. We disagree. Early snow melt could have significant impacts on water run-off rates, thus affecting stream flow and drainage patterns. Early snow melt would result in a build up of water with no place to go. Ground is frozen or underlain by permafrost and streams and rivers are still frozen or ice covered. Thus, when break up occurs more water is present causing increased run-off which could result in increased flooding.

   The discussion of impacts from ice roads has been deleted.

8. We disagree. Many of the activities associated with oil and gas development require the use of large quantities of water. It is true that water appears to be plentiful on the Yukon Flats Refuge. It is also true that much of the water utilized in drilling and other activities is returned to the environment (the large quantities of water used during injection are not). However, fish and other aquatic species are often sensitive to even minor variations in water levels, water temperature, and water quality - all of which could be affected by oil and gas related activities. It is possible that surface and ground water in the vicinity of drilling sites could be depleted and, if not depleted, would at least be altered significantly.

9. We disagree. Even with the involvement of the Corps of Engineers, the Environmental Protection Agency, and the U.S. Fish and Wildlife Service, water quality and quantity are being altered by oil and gas development. See above responses 4, 6, 7, and 8.

10. Your concerns are noted. However, we do believe the discussion of potential impacts to the social conditions on the refuge is an accurate depiction of what could happen if Alternative B were implemented.

11. The discussion of impacts to cultural resources under Alternative B is correct. Although site-specific inventories and evaluations would be completed and mitigation or preservation measures implemented as necessary, it is still possible that not all cultural resource sites will be identified. Cultural sites, particularly those of pre-historic age, are often buried and difficult to identify during normal field inventories. The excavation of soil surfaces overlaying such sites can result in damage to these sites, even if work is halted as soon as it is recognized that a cultural site is present.

ALASKA OUTDOOR COUNCIL, INC.
3780 McGINNIS DR. JUNEAU, AK 99801
(907) 789-3450

December 4, 1985

Robert E. Gilman
Regional Director
USF&WS
1011 E. Tudor Road
Anchorage, AK 99503

Attention: Bill Knauer

This letter is in response for public comments regarding the draft Comphrehensive Conservation Plan/Environmental Impact Statement and Wilderness Review for the Yukon Flats National Wildlife Refuge, Alaska. The Alaska Outdoor Council is pleased to offer the following comments.

The AOC supports entirely the critical review and comments of Mr. James G. King, 1700 Brant Road, Juneau, AK. Mr. King's comments Are also those of the AOC, it's 44 affiliates and 9000 members in Alaska. AOC is especially concerned that the drAft plan does not provide for alternative options and techniques for the increase or re-establisment of game species formerlly residing within the refuge. This is an oversight that we hope the final plan will contain. 1

We are especially concerned that water stabilization projects for the enhancement of waterfowl populations were not included in view of the fact that the Yukon Flats are perhaps the most productive waterfowl nesting habitat in North America.

Thank you for this opportunity to comment.

Sincerely,

Rupe Andrews
President, AOC

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361

Affiliated with National Rifle Association

Response to Alaska Outdoor Council, Inc.

1. In the final plan, three items are listed in Table 13 which deal with the introduction or re-establishment of wildlife species on the refuge. Introduction of exotic wildlife species (species not native to North America) is not permitted on the refuge. However, introduction of native wildlife species (introduction of species native to North America, but outside their original range) and wildlife stocking (re-establishing, augmenting, or maintaining native species within their original breeding range) may be allowed in all management categories under all alternatives analyzed in the final plan (as in the draft plan). In the final plan, water stabilization projects (included under the category of habitat manipulation) for the benefit of waterfowl populations are permitted in areas of the refuge in the intensive and moderate management categories on a case-by-case basis subject to provision of NEPA and a compatibility determination. However, no areas of intensive or moderate management are included in Alternative D, the Service's preferred alternative.

   As you indicate, the Yukon Flats are perhaps the most productive waterfowl nesting habitat in North America. Because of this high level of production, the refuge staff sees no reason to alter the current water regime on the refuge by proposing any water stabilization projects for the refuge at this time. There is no present evidence that the productivity of the refuge is likely to change significantly over the next several years. However, if a significant decline in waterfowl production does occur which can be directly tied to habitat conditions on the refuge, water stabilization projects could be undertaken as emergency measures to stabilize or increase the waterfowl population. In addition, the plan for the Yukon Flats Refuge will be reviewed periodically and revised if necessary. If conditions warranted, additional provisions for water stabilization projects could be included in the plan at that time.

ALASKA WATERFOWL ASSOCIATION
3105A LAKESHORE DRIVE, SUITE 102
ANCHORAGE, ALASKA 99503
TEL. (907) 243-3235

October 11, 1985

Mr. Robert Gilmore, Regional Director
U.S. Fish & Wildlife Service
1011 E. Tudor Road
Anchorage, AK 99503

RE: CCP/EIS Yukon Flats
National Wildlife Refuge

Dear Director Gilmore:

We do not object to reasonable oil and gas exploration on the refuge if it is not in areas of colonial nesting, pose a high risk to moulting birds and is not active in nesting areas from April 20 to mid July.

Because of terrific losses of geese in the Y-K Delta special care or even prohibition should be considered in areas where whitefronts and cackling geese nest.

Exploratory activities during the winter months should pose no unusual problems. Please include this in the record.

Very truly yours,

John W. Hendrickson
President

cc: T. Fink
W. W. Sherwood
T. Colton
T.W. Patch
M. Maier, WHOA

JWH:kmf

ALASKA WATERFOWL ASSOCIATION
3105A LAKESHORE DRIVE, SUITE 102
ANCHORAGE, ALASKA 99503
TEL. (907) 243-3235

December 20, 1985

Mr. William W. Knauer
U.S. Fish and Wildlife Service
Region 7
1011 East Tudor Road
Anchorage, Alaska 99503

RE: Supplemental to Draft
December 1985

Dear Mr. Knauer:

The Yukon Flats is indeed an important duck and goose nesting rearing and feeding area.

It appears that under subsistence management on page one it is expected that current opportunities for participation in traditional activities would be maintained. In that regard we have several questions:

1 1. What was the subsistence harvest of ducks and geese in this area in 1930?

2 2. What was the subsistence harvest of ducks and geese in this area in 1950?

3 3. What percent of the diet of natives in this area is presently represented by ducks and geese?

4 4. Would current participation in traditional activities include the use of modern aircraft in carrying out these activities? And would it include use of modern autoloading and pump shotguns etc?

5 5. What is the native or rural population in the Yukon Flats area today as opposed to forty years ago?

*Note we perceive a threat to waterfowl and other species by an ever increasing privileged class of people who may use the most modern methods and means and yet creating increasing and most often unregulated pressure on the waterfowl resource. This is especialllly true when out of season egg gathering and spring shooting of mated pairs is involved.

Generally governmental assistance to promote the expansion of remote towns or settlements should not be encouraged where the only reason for its (the town's) existence is to subsist on wild resources. In such a situation government funds such as fuel subsidies, welfare, foodstamps, aid to dependent children, village government grants etc. encourage and support a human population increase in these areas which have only two sources of income and support: subsistence on fixed wild resources and state and federal governmental welfare giveaways. People in these areas then have no incentive to develop modern skills which are necessary to cope with an increasingly modern and skill demanding world. In such a situation the local rural population becomes increasingly dependent on a dwindling wildlife resource and more and more governmental assistance. This in the long run is harmful and perhaps fatal to these rural residents who will see the day when neither the resource nor the government will continue to support them.

We do not believe oil and gas development under proper regulation is harmful to waterfowl resources. In over 20 years we have not seen such damage in Cook Inlet, the North Slope, nor in the Mississippi Delta or California. This would be especially true if much of the development work were done in the winter.

6 Under Alternative "C" please explain in what manner 22% of the wetlands would be adversely effected by oil and gas exploration etc. on the Yukon Flats.

7 Subsistence management is spoken of on several occasions. Please advise what subsistence management has taken place so far on the Yukon Flats. Also we would like to know what enforcement of that management has occurred?

8 Will areas designated as wilderness be open to the use of aircraft, snow machines, all terrain vehicles, air boats and other like equipment by subsistence users? Will seasons and bag limits be observed in such areas by subsistence users? If not, have you not then merely created an exclusive native hunting and fishing preserve without bag limits or other proper protection. Such policies have already led to an environmental disaster in another refuge.

Is it not preferable that Yukon Flats be carefully and scientifically managed rather than created a wilderness? Would this not better serve the interest

of the general public and the resources?

Lastly, we would like to see proposals for possible wetland expansion in Yukon Flats as human activity tends to destroy wetlands.

Very truly yours,

John W. Hendrickson, President

cc: T. Fink
D. Whitesell, DU
Sen. Murkowski
T. Colton
W.W. Sherwood
T.W. Patch

JWH:kmf

Response to Alaska Waterfowl Association.

1. We have been unable to find any documentation of levels of subsistence harvest of waterfowl for 1930 or that time period.

2. We have been unable to find any documentation of levels of subsistence harvest of waterfowl for 1950 or that time period.

3. Contemporary use of the waterfowl resource in and around the Yukon Flats is important in the economies of the region. Approximately 11,000 ducks and 3,000 geese were reported harvested annually in the early 1970's by residents of the Fort Yukon subregion of the Doyon Native region. These estimates may be conservative, but represent approximately 2.2 percent of the total usable weight of food sources harvested (U.S.D.I., 1974).

4. Section 1110(a) of ANILCA states that " . . . the Secretary shall permit, on conservation system units, . . . the use of snowmachines (during periods of adequate snow cover, or frozen river conditions in the case of wild and scenic rivers), motorboats, airplanes, and nonmotorized surface transportation methods for traditional activities (where such activities are permitted by this Act or other law) and for travel to and from villages and homesites." To the best of our knowledge, aircraft are not used in the harvest of waterfowl by local residents, as such harvest occurs primarily near villages or in conjunction with moose hunting which is generally done by boat. (See Caulfield, 1983.)

   Autoload and pump shotguns have been used by local residents for many years and would continue to be permitted for subsistence hunting.

5. Population estimates for 40 years ago are difficult to find as census data for this period was often incomplete or was not gathered at all. The information which is available would tend to indicate that the past regional population was probably not significantly different than at present, though possibly slightly lower than the present population. Caulfield (1983) quoted population figures for Venetie (63 in 1933) and Fort Yukon (600-650 in 1940). The 1950 census included population estimates for Beaver (101), Circle (83), Fort Yukon (446), Stevens Village (84), and Venetie (81) for a total population of 795. However, no figures were given for Birch Creek or Chalkyitsik. It is also important to note that census taking in the past often failed to include many residents who were living outside of organized communities, a factor which could account for a significant number of area residents. In the past, more residents lived outside of organized communities because access to the resources they required for subsistence was more difficult necessitating a more nomadic way of life than at the present time.

6. As indicated in the supplement to the draft Yukon Flats Plan, impacts to wetlands from the implementation of Alternative C would be similar to the impacts discussed under Alternative B. Alternative C, as revised in the supplement, would permit oil and gas leasing and development on the 26 percent of the refuge in the moderate management category. Briefly, impacts from seismic activities should have negligible effect on waterfowl if undertaken during the winter. Increased noise and visual disturbance resulting from oil field development, especially during periods of nesting, molting, and staging can have significant adverse effects on most waterfowl species. Such disturbance can lower reproductive success, lower survival rates, and cause abandonment of key habitats (nesting and breeding habitats, staging areas). In addition, construction and production phases of oil field development could result in direct habitat loss, degradation of water quality, and alteration of surface and groundwater drainage patterns. The discussion of impacts under Alternative B provides additional detail.

7. Regulation of subsistence harvest on the refuge has been in the hands of the Alaska Department of Fish and Game through hunting, fishing, and trapping regulations developed by the state regulatory boards. Enforcement of these regulations has occurred at a level commensurate with the level of staffing available. The Service's role is primarily one of monitoring the State's activities and making recommendations to the regulatory boards.

8. Section 1110(a) of ANILCA states that " . . . the Secretary shall permit, on conservation system units, . . . the use of snowmachines (during periods of adequate snow cover, or frozen river conditions in the case of wild and scenic rivers), motorboats, airplanes, and nonmotorized surface transportation methods for traditional activities (where such activities are permitted by this Act or other law) and for travel to and from villages and homesites." This includes use in designated wilderness areas. Air and air-cushioned boats are specifically prohibited under Service regulations (50 CFR 36) regardless of management category.

   Hunting, fishing, and trapping are subject to appropriate state regulations throughout the refuge, regardless of the management category under which an area is managed. This includes designated wilderness.

FOUNDATION OF BIOLOGIC RESEARCH

PRIVATE INTERNATIONAL INSTITUTION

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20/I/86
PL/0360k

In reply refer to: C(026)86

Mr. Bill Knauer
Regional Director
Fish and Wildlife Service
1011 East Tudor Road
Anchorage, Alaska 99503

Dear Mr. Knauer:

I have read the Comprehensive Conservation Plan /Environmental Impact Statement and Wilderness Review for the Yukon Flats National Wildlife Refuge in Alaska and its supplement about changes in the Fish and Wildlife Service Policy on oil and gas exploration and leasing.

Without doubt, the Alternative that must be selected to be implemented in the Final CCP/EIS, is Alternative E, which gives a real protection to the Yukon Flats environment. The oil and gas leasing is totally incompatible with the wildlife's welfare and we have many examples of that in all the world. If the leasing is allowed, will be only cuestion of time to see in a mid or long - term future only small patches here and there of untouched wilderness in the Refuge, which then could be all but a wildlife Refuge. In the Alternative E the Service would recommend that all Refuge lands be designated as wilderness. For other part, this Alternative create a 40% increase in the costs if it is implemented, only a 5% more than Alternative D (the current preferred Alternative). We hope that the maximum protection will be giben to such balanced environment as Yukon Flats.

Thank you in advance.

Sincerely

F.J. Pechir

F.J. Pechir Ph. D.
President

FJP'as
P.S. One more copy will be sent to you.

ALL RIGHTS RESERVED

National Audubon Society

ALASKA REGIONAL OFFICE
308 G STREET, SUITE 217, ANCHORAGE, ALASKA 99501 (907) 276 7034

February 10, 1986

Robert Gilmore, Regional Director
U.S. Fish and Wildlife Service
1011 East Tudor Road
Anchorage, AK 99503

Dear Mr. Gilmore:

These are the comments of the National Audubon Society on the draft Yukon Flats National Wildlife Refuge Comprehensive Conservation Plan, Environmental Impact Statement and Wilderness Review dated September, 1985.

After thorough review of these draft documents, we recommend that a strengthened Alternative E, the wilderness alternative, be adopted as the preferred alternative for managing the refuge over the next five to ten years. Alternative E would not only provide the best protection to the refuge, but would be the most cost effective (economical) as well.

The Service's refuge and planning staffs are to be congratulated for a fine effort in preparing the draft documents. Overall, they have taken a sound approach to management planning. Management issues have been quite thoroughly addressed, and a wealth of information that will prove vital to effective refuge management in the years ahead has been included. We were especially pleased to see a discussion of the basic federal laws and international treaties that relate to protection and management of refuge resources, along with a good summary of information obtained from the public involvement process to date. Inclusion of this important information represents a significant improvement over earlier planning documents for national wildlife refuges in Alaska.

Unfortunately, what could have been an excellent comprehensive conservation plan has been seriously compromised by unsound Department of the Interior policies on oil and gas exploration and leasing, and wilderness. These policies seriously conflict with the high purposes for which the Yukon Flats NWR was established by Congress in the Alaska National Interest Lands Conservation Act of 1980 (ANILCA).

OIL AND GAS EXPLORATION AND LEASING

As clearly pointed out on page 159, certain species of migratory birds are extremely sensitive to noise and visual disturbances during nesting and molting. "...Ducks and geese molting in late summer or staging in spring and fall are also sensitive to disturbance...Construction and production phases of oil field development would affect waterfowl both directly and indirectly...In addition, oil field development has the indirect effect of improving access and, thus, the opportunity to harvest."

1 Not mentioned in the discussion is the fact that such commercial developments inevitably result in a reallocation of always scarce refuge personnel and funds away from wildlife and public use management to monitoring of the commercial intrusions. Seldom if ever have additional resources been provided to the U.S. Fish and Wildlife Service as add-ons in the appropriation process to prevent the refuge mission from being compromised. For example, monitoring and studying oil and gas exploration on the coastal plain of the Arctic National Wildlife Refuge is currently consuming 90% or more of that refuge's manpower and financial resources. The result is virtual abandonment of wildlife and public use management on much of the remainder of the refuge.

Meanwhile, the Service admits on page 23 of the draft plan for the Yukon Flats NWR that, "the absence of an adequate level of enforcement, surveillance, and monitoring may result in significant damage to fish and wildlife populations, and other resources found on the refuge" (emphasis added).

Given its incompatibility with refuge purposes, the extremely poor prospects for discovery of commercial quantities of oil on the refuge, the current world oversupply of oil, dramatically falling oil prices, cutbacks in oil company exploration programs, and probable further cuts in an already understaffed and underfunded refuge program, how can the Department of the Interior justify adopting a policy that essentially invites industry to explore for oil and gas on the Yukon Flats NWR? The policy is both unsound in terms of the broad, long-term national interest in energy conservation, and irresponsible from the standpoint of the Service's mission to protect and manage wildlife on the Yukon Flats NWR consistent with the purposes for which it was established. We strongly urge, therefore, that October 9, 1985 changes in Service policy on oil and gas exploration and leasing in Alaska refuges be abandoned!

WILDERNESS

The Service's half-page summary of wilderness suitability is a second serious shortcoming in the plan. Section 1317 of ANILCA requires the Secretary of the Interior to conduct his review of all refuge lands as to their wilderness suitability in accordance with Sections 3(c) and 3(d) of the Wilderness Act. The two superficial criteria listed on page 139 of the draft plan that the service has used to guide its wilderness suitability review on the Yukon Flats NWR are totally inconsistent with the intent of Congress in those two sections of the Wilderness Act. Who developed these criteria and how can they be justified?

Nothing in ANILCA or the Wilderness Act suggests that the Service limit its review to, "(1) the need for wilderness unit boundary adjustments and (2) the addition of selective areas with outstanding resource values that may have been inadvertently overlooked during the original wilderness review and subsequent designations undertaken by Congress" (page 139). Since these superficial and biased criteria are inconsistent with federal statutory law, they should be revoked.

In order to satisfy congressional intent in both ANILCA and the Wilderness Act, the Service is urged to reevaluate the wilderness resource on the Yukon Flats NWR. A thorough "Wilderness Review" should then be prepared in which all wilderness values on the refuge are identified, including outstanding opportunities for solitude, and primitive and unconfined types of recreation. All lands found suitable as wilderness should then be recommended for inclusion in the National Wilderness Preservation System unless serious conflicts with refuge purposes or management needs can be demonstrated.

Additional concerns and recommendations are as follows:

1. Protection of the refuge will be inadequate based on the statement on page 23 that, "the absence of an adequate level of enforcement, surveillance, and monitoring may result in significant damage to fish and wildlife populations and other resources found on the refuge."

   Recommendation: The Service is required by law to prevent significant damage from occurring to fish and wildlife populations on the refuge. It is essential, therefore, to clearly define in the final plan what must be done to prevent this from happening. This should include the personnel and financial resources that will be required.

2 2. Permitted activities in wilderness are not identified in Tables 11 (pages 114-115) or 12 (pages 117-122).

2 Recommendation: Since almost the entire refuge is defacto wilderness and has been found suitable for inclusion in the National Wilderness Preservation System, uses that are permitted in wilderness should be added to both Tables 11 and 12. This is especially important since the Service admits on page 116 that, "...the minimal management designation does not provide the same degree of protection as does wilderness designation" (emphasis added).

One of the biggest problems in management of Alaska refuges is the lack of public understanding of what can and cannot occur in designated wilderness areas. The Service has both an opportunity and a responsibility to help educate the public on this important resource in the comprehensive planning process.

3. Snowmobile races are to be permitted under both intensive and moderate management (Figure 12, page 119).

Recommendation: Such nonwildlife oriented commercial and competitive sporting events are not compatible with refuge purposes and should be prohibited.

4. Wilderness enjoyment is not identified as a recognized and permitted public use (Table 12, page 119).

Recommendation: Since almost the entire refuge is defacto wilderness, the outstanding opportunities it affords for solitude, and primitive and unconfined types of recreation should be recognized and encouraged where compatible with refuge purposes. . .

3 5. Power boats, to include inboard and outboard motor boats, jet boats, air boats, and air-cushioned boats are to be permitted "except in areas closed by regulation" (Figure 12, page 121). Meanwhile, on page 134 it states that, "...the use of airboats and air-cushioned boats will be prohibited under all alternatives."

Recommendation: As accurately discussed on page 159, many of the refuge's migratory birds "...are extremely sensitive to noise and visual disturbance during nesting and molting. Waterfowl could be frightened off nests, exposing eggs and young to weather and predation. Continual harassment can lower reproductive success and cause birds to abandon key habitat in favor of less suitable, more isolated sites."

The plan further states on page 159, "ducks and geese molting in late summer or staging in spring and fall are also sensitive to disturbance. Molting and staging are periods of great physiological stress and high energy

3 demands...Without stringent environmental controls, traditional spring and fall migration and staging areas could be abandoned" (emphasis added).

Given the importance of the refuge to production of waterfowl and other migratory birds, and the vulnerability of these birds to disturbance, power boats such as jet boats, air boats and air-cushioned boats should be prohibited on the refuge under all alternatives. A possible exception might be portions of the main stem of the Yukon River away from wildlife concentration areas where use of such boats may be important to human safety.

6. Cooperation with the state: While we strongly support the goal of enhancing state-federal relations in management of Yukon Flats NWR, we find the draft plan proposes unlawful delegation of management responsibility to the state. In fact, certain sections show more concern for state jurisdiction than effective wildlife conservation in the national interest. For example, on page 123 in the section on "Management Directions Common to All Alternatives", the statement is made that, "In 1982, the Service signed a cooperative agreement with ADF&G concerning fish and wildlife management responsibilities and jurisdictions. Under the agreement, ADF&G has the primary responsibility for managing fish and wildlife resources on the refuge and the Service has the primary responsibility for managing habitats..." (emphasis added). The statement refers to the Master Memorandum of Understanding Between the Alaska Department of Fish and Game and the U.S. Fish and Wildlife Service.

As set forth in our comments dated November 29, 1982 on "Draft Departmental Fish and Wildlife Policy," 47 Federal Register 46417, October 15, 1982 (please see copy attached), we found the policy on which the Master Memorandum of Understanding referred to above is based fails to comply with law in allocating wildlife management responsibility between states and the federal government. As a result, we believe that crucial portions of the draft plan will be subject to legal and political challenges that will defeat the intended goal of fostering state/federal cooperation in wildlife conservation on the Yukon Flats NWR.

7. Cooperation with private landowners: We strongly support the Service's sound policy regarding the intent to cooperate with private landowners both within and adjacent to the refuge. We especially appreciate the commitment to maintain ongoing communication and to seek establishment of land bank agreements (pages 123-125).

Recommendation: The Service is urged to undertake a comprehensive evaluation of all private inholdings and

prioritize them for eventual inclusion in the refuge through acquisition, trade or lease. This is especially important for the high waterfowl production areas, since, "...75 percent are within private ownership and 25 percent are on the refuge proper" (page 19).

8. Data collection and research: Lack of current comprehensive biological data is one of the major problems facing managers on the refuge In fact, very little such data has been collected on the Yukon Flats since the 1960's. We are pleased, therefore, to see it stated on page 126 that, "...under all alternatives, the Service will undertake studies and research necessary to improve the refuge data base."

   Recommendation: Since biological data gathering and research will require a major commitment of staff time and funds, we urge that a "Comprehensive Biological Study Program" be developed for the refuge. Cooperation should be sought in developing the program from the Service's Research Division, the Alaska Department of Fish and Game, the University of Alaska and other interested parties.

9. Wildlife Management: "Under all alternatives, wildlife populations on the Yukon Flats NWR will be maintained at or above current levels, allowing for natural fluctuations in populations to occur..."(page 126). Yet, existing population levels are not known for many species, while for others it is known they are far below historic levels.

   Recommendation: Special consideration should be given to restoring depressed populations of wildlife to optimum levels. While we agree with giving, "...special attention to maintaining the refuge's waterfowl population..." (page 127), it should be made clear this will be done as consistent as possible with refuge purposes, and goals of the North American Waterfowl Management Plan and appropriate flyway management plans.

10. Fire management: The policy stated on page 131 that, "Fires will be allowed to burn naturally when not threatening life or property. If fire suppression becomes necessary, state of the art techniques and the "minimum appropriate tool" concept will be utilized."

4 Recommendation: We strongly support adherence to this sound fire management policy. Special mention should be made, however, that the effects of wildfire on refuge wildlife populations and habitats should be closely monitored, and subjected to ongoing research.

5 11. Subsistence use management: Although subsistence uses of refuge resources have potential for causing serious impact, no mention is made of managing or regulating such uses consistent with a management plan, scientific management principles, and biologically sound regulations (pages 131-134).

   Recommendation: The Service is urged to develop a "Subsistence Management Plan" for the refuge in cooperation with the local people and the Alaska Department of Fish and Game. The plan should contain research, management, information/education, and law enforcement components. Once developed, biologically sound regulations should be adopted to implement the plan. In other words, all subsistence uses on the refuge should be conducted consistent with scientific management principles and biologically sound regulations designed to conserve fish and wildlife resources. Strategies for enforcing regulations should be as fair as humanly possible, and reflect geographic, cultural, and political realities.

12. Helicopter use will be permitted on the refuge only with issuance of a special use permit (page 134).

   Recommendation: Because of the potential for serious disturbance to wildlife, helicopter use should be permitted only for the protection and management of the refuge and restricted to specific routes, areas and times.

13. "An education and interpretation program will be adopted to help avoid potential problems by increasing public understanding of and support for refuge management goals and actions" (page 136).

   Recommendation: We strongly endorse the Service's commitment to an ongoing education and interpretation program with special emphasis on refuge visitors, and local landowners and school children. We couldn't agree more with the statement on page 136 that, "The success of most of the management activities outlined in the plan will depend to a large extent on the actions of refuge users, adjacent landowners, local residents, and other interested citizens."

14. Agricultural development, livestock grazing (including reindeer grazing), hydroelectric development, onshore facilities associated with commercial fishing (except existing facilities) and other commercial activities have been determined to be incompatible with refuge purposes...They would not be permitted under any alternative included in this plan" (page 139). Yet oil and gas exploration and leasing could be found compatible according to Robert E. Gilmore's letter of October 9, 1985 that was inserted in the draft plan.

Recommendation: We concur fully with not permitting the commercial activities mentioned, and urge the Service to adopt this policy in the final plan. Oil and gas exploration and development should be prohibited as well, however, since they could have even more serious impacts on refuge resources than the aforementioned commercial activities.

6 15. The wilderness suitability section is abbreviated, incomplete, fails to make a comprehensive suitability finding, fails to discuss wilderness values including "outstanding opportunities for solitude and primitive and unconfined types of recreation", and fails to make wilderness recommendations. It is, therefore, inconsistent with the intent of both sections 3(c) and 3(d) of the Wilderness Act and section 1317 of ANILCA.

Recommendation: As stated previously, this is the most seriously deficient section in the entire plan. We urge the Service to thoroughly evaluate the wilderness resource on the Yukon Flats NWR and make a suitability finding consistent with federal statutory law.

7 16. Detailed refuge management plans will be developed for the refuge following adoption of the comprehensive conservation plan (page 140), but no mention is made of the need for a "Waterfowl Management Plan" or a "Subsistence Management Plan."

Recommendation: Since the Yukon Flats NWR constitutes one of the most important waterfowl production areas on the continent, a "Waterfowl Management Plan" should be prepared for the refuge. This should be done in full cooperation with the Alaska Department of Fish and Game and other interested parties, and be made as consistent as possible with the North American Waterfowl Management Plan and other appropriate flyway management plans. And as previously recommended in concern 9, preparation of a "Subsistence Management Plan" should also be committed to.

8 17. Critical waterfowl habitats occur on the refuge where birds are particularly vulnerable to disturbance and harassment during nesting, molting and staging periods. Yet these areas are not identified.

Recommendation: Where possible, identify particularly sensitive waterfowl habitats that should be made seasonally off-limits to major human disturbance.

9 18. Oil field development would adversely affect waterfowl both directly and indirectly (page 159), yet no mention is made

9 if the need to devote substantial amounts of refuge staff time and financial resources to the monitoring of oil and gas developments should they eventually be permitted.

Recommendation: Acknowledge the fact that additional refuge staffing and funding will be required to adequately monitor oil and gas exploration and development. Otherwise, the refuge's overall management program could be seriously jeopardized. On other Alaska refuges where such commercial activities have been permitted, scarce resources have been reallocated to the detriment of fish and wildlife resources and public uses. The situations on the Kenai and Arctic national wildlife refuges are two good examples of this.

10 19. Utilization and displacement of species would occur under the preferred management alternative, "...but with monitoring and regulation by ADF&G and the Service, long-term productivity would be maintained" (page 176).

Recommendation: To allow "displacement of species" to occur is not responsible management, and is inconsistent with refuge purposes. Management of wildlife populations on the refuge whether for subsistence or recreation should be consistent with scientific principles that prevent such displacement from occurring. Furthermore, cooperation in research, planning, management, information/education, and law enforcement - in addition to monitoring and regulation will be essential if long-term productivity or refuge fish and wildlife populations are to be maintained.

By adopting the aforementioned recommendations, we are confident that Alternative E will prove to be the best alternative for management of the Yukon Flats NWR over the next five to ten years.

Thank you for providing us the opportunity to comment, and for your consideration of these concerns and recommendations.

Sincerely,

David R. Cline

David R. Cline
Regional Vice President

cc: Peter Berle, National Audubon Society
Dick Martyr, National Audubon Society
Alaska Audubon chapters
Other Alaska conservation organizations

Response to National Audubon Society.

1. We agree that funding and personnel would be required to monitor and study the effects of increasing commercial use on the refuge on fish and wildlife populations and their habitats. It is for this reason that the relative costs of implementing Alternatives B and C are significantly higher than costs shown for the other alternatives where commercial development would be severely limited. You are correct in saying that, should commercial development occur without additional funding and personnel being provided, reallocation of existing personnel and funds away from wildlife and public use management to monitoring of the commercial activities would occur.

2. Designated Wilderness has been added as a management category to Table 13.

3. The draft plan is incorrect when it includes air and air-cushioned boats under Power Boats on page 121. Air and air-cushioned boats are considered off-road vehicles (included in the Other Motorized Vehicle category in Table 13 of the final plan) and would be prohibited on the refuge except in areas opened by regulation. This designation is a reflection of current Service policy. It must be noted, as well, that many of the waters on the refuge have been determined to be navigable. The State of Alaska has jurisdiction over these waters, though the Service does have the authority to regulate certain activities on navigable waters which affect refuge lands.

4. The need to monitor and study the effects of wildfire on refuge fish and wildlife populations and habitats has been added to the discussion of fire management in the Common Management portion of the Management Alternatives section of the final plan.

5. At this time, it is not the intent of the Service to prepare subsistence management plans for each of the refuges. Rather, subsistence considerations would be included in management plans developed for individual or groups of species (or activities such as information and education programs) as subsistence harvest is an integral factor in management of these species. However, depending on the resolution of current questions related to subsistence management on federal lands in Alaska, the Service may decide that subsistence management plans are more advantageous for outlining subsistence management. Whether a specific subsistence management plan is developed or subsistence management is incorporated into other management plans, the Service will monitor subsistence activities on the refuge to ensure the continued viability of subsistence resources.

6. An expanded wilderness review has been included in the final plan.

7. Waterfowl has been added to the list of potential management plans to be prepared following adoption of the Comprehensive Conservation Plan for the Yukon Flats Refuge. See response 5 above relative to subsistence.

8. Although data on waterfowl use of the refuge has been collected over a relatively long period (particularly as part of the Rampart Dam studies of the late fifties and early sixties), critical waterfowl habitats on the refuge have not been defined by the Service. The refuge staff is currently gathering additional information on the distribution of breeding pairs of waterfowl on the refuge, data which provides information that can be related - in a general way - to areas of high nesting density on the refuge. Although it appears that these concentration areas vary somewhat from year to year, they generally correlate with the areas of highest drake densities defined by the Lensink studies of the early and mid sixties, shown in Figure 13. In the broadest sense, these concentration areas can be related to critical waterfowl nesting habitat. Information relative to other critical habitats - molting and staging areas - has been gained only through observation. No recent data have been gathered specifically for the purpose of identifying and defining these areas.

9. See response 1 above.

10. This statement was not intended to mean that the entire population of a species found on the refuge would be displaced, although we recognize how this misunderstanding could occur due to a poor selection of words. The intent of the statement was that individual members of a species could be displaced, not entire populations. Wording of this statement has been changed in the final plan.

NATIONAL RIFLE ASSOCIATION OF AMERICA
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RUPE ANDREWS
FIELD REPRESENTATIVE
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December 4, 1985

Robert E. Gilman
Regional Director
USF&WS
1011 E. Tudor Road
Anchorage, AK 99503

Attention: Bill Knauer

This letter is a late response for public comment regarding the draft comphrhensive plan/Environmental Impact statement and Wilderness Review for the Yukon Flats National Wildlife Refuge, Alaska.

Because of the very short time constraints to get this comment in by the deadline I will refer you to those comments prevously submitted by Mr. James G. King, 1700 Brant Road, Juneau, AK. Mr. Kings excellent review and pertinent points especially regarding alternatives for enhancing all wildlife populations
1 should be carefully noted in the final draft plan. It seems somewhat incongruous that all professional and scientific options and techniques for increasing, establishing or the enhancement of existing fish and wildlife populations not be considered inview of the importance of this refuge for producing waterfowl to the continents' major flyways.

The National Rifle Association is deeply concerned that the opportunities for future hunters of America not be deminished. The Yukon Flats Refuge presents a unique oppotunity and challange to increase the number of waterfowl for the nation"s
1 hunters. By prohibiting all or any manipulation of water resources within the refuge enhabcement opportunities cannot be implemented.

Thank you for this opportunity to comment for the 22,000 Alaskan NRA membership.

Sincerely,

Rupe Andrews
Alaska Field Representative

371

Response to National Rifle Association of America.

1. Options for increasing, establishing, or enhancing existing fish and wildlife populations are included in the alternatives analyzed in the final plan (as in the draft plan). Reestablishing native populations is an option included under all management categories in all the alternatives. In the final plan, water stabilization projects (included under the category of habitat manipulation) for the benefit of waterfowl populations are permitted in areas of the refuge in the intensive and moderate management categories on a case-by-case basis subject to provisions of NEPA and a compatibility determination. However, no areas of intensive or moderate management are included in Alternative D, the Service's preferred alternative.

   The Yukon Flats area is currently one of the most productive waterfowl nesting areas in North America. Because of this high level of production, the refuge staff sees, at this time, no reason to alter the current water regime on the refuge by proposing any water stabilization projects simply to enhance current production. There is no present evidence that the productivity of the refuge is likely to change significantly over the next several years. However, if a significant decline in waterfowl production does occur, water stabilization projects could be undertaken as emergency measures to halt the decline and begin reestablishing depleted waterfowl populations. In addition, the plan for the Yukon Flats Refuge will be reviewed periodically and revised if necessary. If conditions warranted, additional provisions for water stabilization projects would be included in the plan at that time.

Northern Alaska Environmental Center

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FAIRBANKS, ALASKA 99701
(907) 452-5021

February 7, 1986

Robert Gilmore
Regional Director
US Fish and Wildlife Service
1011 East Tudor Road
Anchorage, AK 99501

Dear Mr. Gilmore:

On behalf of the Northern Alaska Environmental Center's 750 members, we appreciate the opportunity to comment on the draft Comprehensive Conservation Plan and its supplement for the Yukon Flats National Wildlife Refuge.

The Northern Alaska Environmental Center is a grass roots conservation organization dedicating itself to the wise management of Alaska's natural resources and to the preservation of Alaska's wildlands. Our organization has placed a high priority on proper implementation of the Alaska National Interest Lands and Conservation Act, which created the Yukon Flats Refuge.

Proper implementation of ANILCA involves the extremely crucial planning process now ongoing in your agency with several refuges. Recent shifts in policy by the Fish and Wildlife Service, either emanating from your office or from Washington, have disrupted a finely working process which appeared to be resulting in planning documents that would have guided well the futures of these nationally significant lands.

Now, however, we feel the integrity of these refuges is seriously compromised by new policies concerning oil and gas exploration and development and wilderness review and recommendations. This unfortunately jeopardizes the intent behind the passage of ANILCA, and impairs the Fish and Wildlife Service's ability to abide by the mandates for which these conservation units were created.

At stake is the protection of some of the most valuable waterfowl production areas left in this country, as well as the preservation of populations of significant wildlife species that are declining or no longer remaining in other areas of their natural range. These problems have come about as a result of some of the very activities your agency currently is attempting to promote on its lands within Alaska.

Our specific comments with regards to these policies follows below. We would urge to consider these points, and strongly encourage you to revise accordingly these policies which have been delivered to planning teams throughout your office. Furthermore, we would like to suggest for those policies stemming from Washington you loooy conscientiously to adopt these changes.

We feel the public's interest would be better served by these changes. And we seriously feel the Fish and Wildlife Service's job will be made considerably easier with the rescission of the directives.

OIL AND GAS

Recently the Fish and Wildlife Service broadened its interpretation of Section 1002 of ANILCA so that, despite having the discretion to place off-limits some areas of the National Wildlife Refuge System, now every square inch of every refuge is open to oil and gas exploration except where wilderness designations prevail, and much more acreage is open to actual leasing.

This shift in policy manifests itself in the realignment of activities which can take place on various categories of land classification within refuges. On minimal management areas oil and gas exploration is allowed, including the potentially very damaging seismic methods, subject to a site-specific compatibility determination. On moderate and intensive management areas leasing can occur, also subject to a compatibility determination.

The discussion of this policy in the supplement to the draft CCP for Yukon Flats makes it appear, however, that a determination by the Secretary of Energy that oil and gas development is in the national interest can override a compatibility determination. This emphasis on national interest over compatibility with the purposes for which each affected area is managed we feel is a clear misinterpretation of Section 1006, and leads us to a very poignant question: Are these oil and gas refuges, or are these wildlife refuges?

Since Yukon Flats was explored for its oil and gas potential, and there is presently little interest on behalf of industry in the refuge, we view this policy as certainly superfluous.

WILDERNESS RECOMMENDATIONS

At the same time the Fish and Wildlife Service is very liberal in its stance on the development of oil and gas resources on wildlife refuge lands, it is also extremely restrictive in its policy on wilderness recommendations mandated by Section 1317 of ANILCA.

Section 1317 calls for the review of all refuge lands in

already designated wilderness as to their suitability for wilderness designation. The Yukon Flats wilderness review found all lands under federal jurisdiction suitable for designation, yet the recommended areas for designation is limited to a mere 6% of the entire refuge.

This decision to limit wilderness recommendations to boundary changes or lands with outstanding resource values is apparently based on Section 101(d) and Section 102(4) which FWS is interpreting to mean that ANILCA obviated the need for additional federal conservation units and wilderness designation allegedly is defined as being a conservation unit in and of itself. This is clearly inconsistent with Section 2(b) of the Wilderness Act which states that wilderness areas do not receive funding for administrative or management purposes as a separate unit.

Equally disturbing as the restricted recommendations is the contention by FWS that even areas recommended for wilderness designation can be explored for their oil and gas potential prior to receiving consideration by Congress for designation. This unbalanced approach to resource development at the expense of resource protection needs to be ameliorated.

OUR RECOMMENDATION FOR A PREFERRED ALTERNATIVE

We recommend FWS select Alternative E, not Alternative D, as the preferred alternative for Yukon Flats National Wildlife Refuge. Given the agency's apparent disinterest in adhering to principles of wise resource management, we feel selection of Alternative E is the most prudent management direction to follow.

Alternative E places all lands in minimal management, and recommends the entire refuge for wilderness designation, which may result in a bit more control over incompatible activities, the occurrence of which FWS is facilitating.

OTHER CONSIDERATIONS

We have further suggestions for changes in the section which describes management directions common to all alternatives.

Of specific concern is the discussion on RS 2477 rights-of-way. These claims should not be mapped in the final plan because they are not legal rights-of-way. Mapping these invalidated claims will only contribute to public confusion regarding status, and will then lead to FWS enforcement difficulties. Any basis for acceptance of rights-of-way need to go through the Title XI process of ANILCA or be validated by a written court order.

Additionally, we would urge the FWS to adopt provisions for a viable local hire program. A problem seemingly prevalent on most refuges is the provincialism of local peoples. In discussions with local native groups who have concerns in this area, we feel the best course of action to assuage some of the undercurrents responsible for these problems would be to implement effective local hire program.

In regards to wildlife management, which the FWS has vested in the Alaska Department of Fish and Game, retaining management of habitat for itself, we would strongly urge you to retain ultimate discretion over controversial wildlife manipulation programs which strive for maximum numbers of consumptive resources sometimes to the detriment of other important species. This is often not the solution to the problem, and very likely hinders wildlife population dynamics more than it helps.

CONCLUSION

These comments are not necessarily detailed suggestions for refinements to the draft Comprehensive Conservation Plan and its supplement for Yukon Flats National Wildlife Refuge. The comments deal with policy issues of a general nature that have seriously and detrimentally affected the planning document at hand, and those which will be forthcoming.

We feel that by working under these current policies, the FWS is shirking its responsibilities for resource management that is at least balanced if not weighted on the side of wildlife. We sincerely hope you may reconsider many of these decisions.

Respectfully,

Randy R. Rogers

Randy R. Rogers
Executive Director

Sierra Club
Alaska Field Office
241 E. Fifth Avenue, Suite 205, Anchorage, Alaska 99501, (907) 276-4048

February 8, 1986

Mr. Robert Gilmore
Regional Director
U.S. Fish and Wildlife Service
1011 E. Tudor Road
Anchorage, Alaska 99503

Re: Sierra Club Comments on Draft Comprehensive Conservation Plan, Yukon Flats National Wildlife Refuge

Dear Mr. Gilmore:

As a result of the recent change in the Fish and Wildlife Service's policy on oil and gas exploration and leasing, the draft plan does not contain a full range of alternatives. Now the plan lacks an alternative that would maintain wilderness values of the refuge until Congress acts on the wilderness recommendations of the Service and others.

Prior to the policy change, Alternative E would have provided such interim protection for the refuge's de facto wilderness pending a Congressional decision on the various wilderness recommendations. Alternative E placed all federally owned refuge acreage in the minimal management category and recommended all minimal management for wilderness. Under minimal management as it then existed, seismic exploration by private industry was not permitted. Interim protection was assured.

But when the Interior Department, at the behest of the oil and gas industry, modified the minimal management category to allow seismic exploration by private industry (where compatible), Alternative E no longer could provide interim protection.

1 In Section 1317(c) of ANILCA, Congress gives the Fish and Wildlife Service the option of providing interim protection. Your original Alternative E reflected this fact. Therefore the Sierra Club recommends that an interim protection or de facto wilderness alternative be included in your final plan for the Yukon Flats and in all of the other refuge plans.

The Sierra Club recommends the adoption of the original Alternative E as the comprehensive conservation plan.

In support of our preference, we note that the Native lands within the refuge constitute 24 percent of the acreage within refuge boundaries. These Native selections generally coincide with the "Yukon Oil and Gas Basin" shown in Figure 7, p.40. Thus there is ample opportunity for Doyon Limited and its constituent villages to seismically explore or even lease outright nearly three million acres within the Basin.

At the same time, the overlap of Native lands with Basin lands provides the Fish and Wildlife Service with the opportunity to manage the surrounding refuge for its natural and wilderness values, while letting the Native landowners take the initiative on oil and gas exploration. If the exploration reveals that oil and gas potential may be present on refuge lands, then the Service at that point could consider authorizing exploration on refuge lands pursuant to Sec. 1010, the Alaska Mineral Resource Assessment Program.

Our other comments on the draft plan are:

RS 2477

2 We recommend that the map of RS 2477 rights-of-way identifications on page 83 be omitted from the final draft. As events have shown on BLM and national park system lands, the identification of an alleged RS 2477 right-of-way can lead to damage to the land by miners and other operators of motorized equipment who undertake the illegal use of these routes.

If the Service does include the map in the final plan, then four steps are necessary. First, the map should display only those identified RS 2477 rights-of-way that represent historic roads or highways, not trails. RS 2477 stated in its entirety that "The right of way for the construction of highways over public lands, not reserved for public uses, is hereby granted." (Emphasis added). Thus in order to qualify as a possible valid historic road or highway right-of-way, the route must be more than mere tracks created by tire, tread, or off-road vehicle marks. Actual construction, improvement or maintenance must have been made by the State or other public entity. A foot or horse trail does not qualify.

Second, the plan should analyze the potential adverse environmental impact of unauthorized use, prior to proof of State ownership, of any identified RS 2477 right of way shown on a map in the refuge plan. The current experience of the BLM and the National Park Service can be referred to as examples of what can happen.

Third, if historic foot and horse trails are to be shown in the final plan, then a separate map should be used.

2 Fourth, a statement should be included to the effect that the identification of historic roads and highways does not authorize public use or state ownership, and that refuge management will prosecute persons attempting to use motorized vehicles on the historic rights-of-way.

Navigable waters

3 In the discussion of navigable waters on pp. 129-30, the statement is made that "In order to protect adjacent federal property, to protect the use of navigable rivers for fishing, boating, and other recreational uses, or for purposes of conservation, the United States has the power to regulate conduct on nonfederal lands (including navigable waters)." Yes, the United States clearly has the power to regulate, but the question under the current administration is whether the Fish and Wildlife Service will be permitted to exercise that power in order to protect refuge resources and values. Has the Service exercised its power to date? If so, please cite some examples that would assist the public in comprehending the scope and intent of this authority. If not, what uses may be regulated?

Wild and Scenic Rivers

In the draft reports prepared by the National Park Service on the Sheenjek and Porcupine study rivers, "...the initial finding was to recommend the Sheenjek for designation as a National Wild River and not to recommend the Porcupine for designation."

What are the Fish and Wildlife Service's recommendations for the two study rivers and what are reasons for the Service's preferences?

For the record, the study report found that the federally owned portion of the Porcupine fully qualified for inclusion in the Wild and Scenic Rivers System as a wild river, but for spurious reasons the administration did not recommend it for such designation.

The final plan could be improved by a comparison of management provisions and uses that apply to non-wilderness refuge lands and refuge lands within wild river corridors. For example, a wild river corridor would not be subject to the kinds of habitat manipulation that could be permitted (where compatible) on non-wilderness refuge lands outside the corridor. Thus the natural diversity management directive of ANILCA would be better fulfilled within a wild river corridor as compared to non-wilderness refuge lands along the same river.

Thank you for the opportunity to comment on the draft plan.

Sincerely,

Jack Hession
Alaska Representative

Response to Sierra Club, Alaska Field Office.

1. The Service believes that the current range of alternatives reflects and is in compliance with the intent of Section 1317 of ANILCA.

2. We recognizes your concerns relative to potential trespass problems resulting from the identification of RS 2477 rights-of-way on a map in the plan. However, the Regional Office has been instructed by the Department of the Interior to include a map in the appendix of each plan depicting the RS 2477 rights-of-way within the boundaries of the given refuge.

   The identification of potential RS 2477 rights-of-way is not necessarily restricted to the identification of historic roads or highways. Such rights-of-way are granted for the construction of highways by RS 2477, which does not specify that these rights-of-way be limited to historic roads or highways.

   It is not practical to analyze the impacts of unauthorized use of potential RS 2477 rights-of-way. Since use is not authorized, we would not be able to adequately analyze the possible impacts as we have no idea of what the unauthorized use might involve.

   The Service has always recognized the fact that the rights-of-way identified by the state are only potential RS 2477 rights-of-way. The validity of these rights-of-way can only be determined in of court of competent jurisdiction.

3. As stated, the United States clearly has the power to regulate conduct on nonfederal lands (including navigable waters) in order to protect adjacent federal property, to protect the use of navigable rivers for fishing, boating and other recreational uses, or for purposes of conservation. If necessary to assert this power in order to protect refuge resources and values, the Service will do so. The Service will coordinate with the appropriate State agency and attempt to cooperatively resolve any issues prior to exercising these rights.

SIERRA CLUB
LEGAL DEFENSE FUND, INC.

Sunrise, Mt. McKinley Ansel Adams

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February 7, 1986

Robert E. Gilmore, Regional Director
U.S. Fish & Wildlife Service, Region 7
1011 East Tudor Road
Anchorage, AK 99503

RE: Comments on Yukon Flats Wildlife Refuge Plan Supplemental EIS

Dear Mr. Gilmore:

The Sierra Club Legal Defense Fund has reviewed the Draft Supplement to the Yukon Flats Wildlife Refuge Plan EIS and Wilderness Review, and would like to submit the following comments on that document.

With the adoption of the new oil and gas policy (Appendix J), the Fish and Wildlife Service is proposing major changes in the management direction of the Yukon Flats Refuge, with attendant impacts on its natural resources and wildlife values. However, these changes are not adequately displayed and evaluated in the supplemental EIS. The draft supplement should be substantially expanded and rewritten to cover, at a minimum, the points outlined below.

Wilderness Review

1 The Supplement proposes to open every alternative in the Draft EIS to oil and gas exploration. This can hardly be considered a meaningful wilderness review in compliance with the standards of the 1964 Wilderness Act and NEPA. The EIS should be revised to display a reasonable range of alternative wilderness/non-wilderness land use allocations, including alternatives which open none and varying amounts of the refuge to oil and gas exploration or leasing. In other words, it should not be automatically assumed in the EIS that exploration is compatible with preservation of wilderness. Rather, it depends upon the type of exploration, its location and extensiveness, timing and duration, and the effectiveness of mitigation measures incorporated into the exploration program. These factors have not been addressed in the draft supplement.

2 Alternatives should also be considered which propose a range of more than the 8% wilderness recommendation in Alternative D and less than the 100% recommendation in Alternative E.. Specifically, these alternatives should include an expanded White Mountains wildernesss area at the Southern end of the Refuge; a Hodzana and Hadweenzic Rivers wilderness alternative; a Black and Little Black Rivers wilderness; a lower Sheenjek/Porcupine wilderness alternative; and a Yukon Flats wildernesss consisting of the highly productive wetlands and lowlands which constitute the prime waterfowl habitat on the refuge. Consideration should also be given to an alternative which designates the primary winter range of the major caribou herds within the refuge as wilderness.

3 In conjunction with this expanded review of wilderness alternatives, the Draft Supplement should also discuss in much greater detail the resources of each of these specific areas and the impacts from nonwilderness designation. In particular, the discussion of impacts from oil and gas exploration and leasing must be vastly improved. Surface disturbing activities are included within the definition of exploration, yet there is no discussion of the site-specific amount or locations of potential surface disturbance or habitat loss, the frequency or intensity of exploration effort -- including access and work crew requirements and impacts -- and no discussion of the types and effectiveness of possible mitigation measures. The EIS's discussion of impacts from oil and gas leasing is similarly deficient in its site-specific analysis.

4 The supplemental EIS is also uninformative in its discussion of the scope and impacts from proposed commercial timber harvest and sand and gravel extraction which are permitted in the intensive land management category. As with oil and gas development, both these activities would likely permanently obliterate the existing wilderness characteristics of the portions of the refuge where those activities may be permitted to occur. The EIS must thoroughly assess these impacts on a site-specific level as part of its overall wilderness review function.

Finally, in revising the wilderness review portion of the EIS, it is critical that the Fish and Wildlife Service correct its erroneous interpretation of its wilderness review responsibilities under ANILCA and the 1964 Wilderness Act. Contrary to the statements in the Draft EIS, consideration of wilderness alternatives should not be artificially restricted so as to render it, in effect,
5 meaningless. ANILCA specifically mandates a comprehensive wilderness review in each refuge management plan according to the standards of the Wilderness Act. Nowhere does this required analysis appear in the draft EIS or the supplement for the Yukon Flats Refuge. Instead, the Service has developed its own impossibly restrictive standards for wilderness review which have no support in the relevant statutes or legislative history. We are extremely concerned that it is precisely because of the Fish and Wildlife Service's misinterpretation of its wilderness review responsibilities that the consideration of wilderness alternatives and impacts to wilderness values from nonwilderness designation is so deficient in the draft and supplement. We would like to see these inadequacies corrected before the management plan is adopted as final.

Oil and Gas Policy

6 The application of the Fish and Wildlife Service's new oil and gas policy to the Yukon Flats Refuge is unclear. Does the Service consider the policy to be an implementation of § 1008 of ANILCA? It appears that this is the case, but the supplemental EIS nevertheless states that the compatibility of exploration with the purposes of the refuge will only be determined in subsequent, site-specific compatibility determinations. However, it seems plain to us that if the Service intends to open the entire refuge to exploration, whether or not there is a decision to also allow leasing at this time, the Service is commencing an oil and gas development program which must be found to be compatible with the refuge's purposes before it is allowed to proceed. The discussion of impacts in the draft supplement, as inadequate as it is, shows that development in the wetlands and lowlands of the refuge could destroy the productivity of one of the

largest waterfowl breeding areas in North America. If this is the case, we do not believe such a program could possibly be compatible with the purposes of the creation of the refuge. In any event, compatibility findings must be included in the refuge plan and EIS, before any such program commences.

The only other possibility is that the Service views oil and gas exploration as merely part of the continuing mineral assessment program authorized in § 1010 of ANILCA. If this is the case, it should be made clear in a revised draft supplemental EIS which explains in more detail the scope and extent of the Fish and Wildlife Service's proposed action.

7 In addition to the compatibility questions, the discussion of oil and gas development in the draft supplement is deficient under NEPA's rigorous standards in many important respects. For example, as with the wilderness review, the discussion of oil and gas exploration and leasing provides absolutely no site-specific information, such as a description of the resource values of the areas proposed to be explored (or leased, under alternatives B and C), or the potential impacts to specific areas and the fish and wildlife resources found there. The appropriateness and effectiveness of mitigation measures are not discussed. The range of alternatives considered is inadequate; for instance, the entire refuge is opened to exploration under every alternative in the supplemental EIS and there are only two leasing alternatives corresponding to the intensive and moderate land management categories. Alternatives should be considered which limit leasing and exploration to a smaller portion of the refuge, and which exclude at least some of the most productive and sensitive wildfowl breeding areas.

8 Another deficiency in the draft supplement is its total failure to consider the cumulative impacts of the various activities proposed on its diverse and significant wildlife populations and habitat; wildfowl survival, breeding and migration; subsistence opportunities; water quality and quantity; and wilderness values. The EIS

8 also totally fails to consider cumulative effects on the refuge from the proposed activities in conjuncion with reasonably forseeable development activities on refuge inholdings and adjacent state and privately owned lands. These impacts could prove to be especially significant in light of the large size of the inholdings in the Yukon Flats Refuge (2.8 million acres total) and their location in important waterfowl breeding areas which also apparently show some favorable oil and gas potential, according to the draft EIS. It is not at all unlikely in these circumstances that development pressures on these adjacent state and private lands will make it all the more important that wildlife habitat on refuge lands be maintained in its current pristine state to support maximum productivity levels.

The inadequacies in the discussion of oil and gas related and other environmental impacts on the refuge have also resulted in a deficient evaluation of impacts on subsistence resources and opportunties. Thus, when the draft supplement is revised, it should reevaluate the subsistence impacts in light of the site-specific information which is required for a complete NEPA analysis. In particular, we believe that loss of fish and wildlife habitat from oil and gas development will quite possibly lead to a significant restriction of subsistence resources which must be evaluated and mitigated to the extent possible in accordance with Title VIII of ANILCA. In addition, the compatibility determination which must preceed any commitment of the refuge to oil and gas activities should expressly discuss compatibility with subsistence, as well as with the other major purposes of the Yukon Flats Refuge.

As a final point with regard to the new refuge oil and gas policy, we question whether there is adequate baseline data on existing wildlife and fish populations to support a decision to open the refuge to oil and gas exploration activities at this time. The draft EIS identifies lack of data as a significant problem facing refuge managers in attempting to optimally meet the statutory goals of wildlife, fish, and water conservation, as well as continued local subsistence needs. Since this is the case, § 304(g) of ANILCA requires that no

commitment to oil and gas activities or other potentially incompatible uses should be made until the significant data gaps are answered by additional research studies.
9 Moreover, the EIS should consider a worst case scenario for the refuge from oil and gas development, in light of this crucial lack of data.

For all the above reasons, we believe the draft supplement should be revised and released again for public comment before moving ahead to preparing a final EIS and plan. We would also appreciate your responding to the comments we have raised here in any revised draft supplemental EIS you prepare. Thank you for this opportunity to comment on the Yukon Flats Refuge draft supplemental EIS.

Sincerely,

Lauri J. Adams
Staff Attorney

LJA/ke

Response to Sierra Club Legal Defense Fund, Inc.

1. See response 1 to Sierra Club, Alaska Chapter.

   Under the current oil and gas exploration and leasing policy for National Wildlife Refuges in Alaska, geological and geophysical exploration (including seismic) may be allowed (except in designated wilderness) where site-specific stipulations can be designed to ensure compatibility with refuge purposes and consistency with management objectives set forth in the plan.

2. A broad range of alternatives has been considered in the draft Yukon Flats plan. We did not feel that it was necessary to include additional wilderness alternatives as these alternatives are within the range of the alternatives analyzed in the draft plan and would differ from Alternatives D and E only in the acreage proposed for wilderness designation.

3. An expanded wilderness review and analysis of potential impacts on wilderness values is included in the final plan.

   We disagree. Given the Service's knowledge of resource values and the refuge oil and gas potential, we believe the plan's discussion of potential impacts from oil and gas leasing (exploratory drilling and development) is adequate, especially in view of the fact that the preferred alternative does not allow oil and gas development on the refuge. In addition, oil and gas exploration, leasing, and development scenarios for each alternative have been incorporated into the Environmental Consequences chapter. Although these scenarios are only hypothetical depictions of what might occur in the future under a given management alternative, they provide a means of analyzing and comparing impacts between alternatives.

4. Additional discussion of the impacts from commercial timber harvest and sand and gravel extraction has been included. Because some interest has been expressed in possible commercial timber harvest on the refuge, a scenario has been developed for this activity under those alternatives where harvest may be allowed (Alternatives B and C, which include areas of the refuge under intensive and moderate management). The discussion of impacts associated with sand and gravel extraction remains "generic" as opposed to more site-specific as little interest has been shown in this activity on the refuge at the present time. As with oil and gas exploration and development, should commercial timber harvest or sand and gravel extraction be proposed on the refuge, a site-specific analysis of impacts would be required prior to authorizing such use.

5. An expanded wilderness review and discussion of environmental consequences is included in the final plan.

6. The Service does consider the oil and gas policy to be the initial step in the process of implementing Section 1008 of ANILCA. Steps in the process of implementing Section 1008 of ANILCA as outlined in the policy include completion of an assessment of the oil and gas potential of the refuge by the Bureau of Land Management; consultation with the Secretary of Energy regarding the national interest in exploring for and developing oil and gas resources on the refuge; and a determination, after considering the national interest in producing oil and gas from such lands, of the compatibility of oil and gas exploration and development with the purposes for which the refuge was established.

7. We disagree. In each alternative in the draft plan a generic worst case analysis was presented. The Affected Environment section of the draft plan provides the necessary description of the resource values of the areas proposed for exploration and leasing required for this type of analysis.

   In the final plan, an oil and gas exploration, leasing, and development scenario has been written for each of the alternatives analyzed and has been incorporated into the Environmental Consequences chapter for the purposes of impact analysis and comparison of impacts between the alternatives. These scenarios provide a realistic indication of the probable level of oil and gas activities that would occur under a given management alternative, thus providing for a more realistic impact analysis. As with the draft plan, the Affected Environment section of the draft plan provides the necessary description of the resource values of the areas proposed for exploration and leasing. Remember, too, that project-specific analysis will occur at the time an exploration or development proposal is submitted to the Service.

   Also, see response 1 to the Sierra Club, Alaska Chapter.

8. Cumulative impacts are addressed to the extent possible when no specific proposals for development on the refuge have been made. Even with the more specific information provided by the scenarios, the potential areal extent of impacts (based on the extent of given management categories) is discussed. In addition, summary statement are provided at the end of many of the impact discussions which provide an overall view of impacts to given resources under a given alternative.

   We agree with your concerns related to the possible development of refuge inholdings and adjacent state and privately owned lands and the impacts such development may have on refuge lands. We are aware of the potential for development of these lands, although the Service has little control over what occurs on these lands. We are not aware of any current plans which have been developed to the extent that analysis of potential impacts on refuge lands can be undertaken with any degree of accuracy.

9. A worst case scenario was analyzed in the draft plan. However, the analysis which results from using a worst case scenario is unrealistic and exaggerated. Therefore, specific scenarios for several activities which may occur on the refuge in the future (including oil and gas exploration and development) have been developed for purposes of impact analysis and comparison between alternatives in the final plan. Although hypothetical, these scenarios project what the Service believes would be a likely level of development were these activities to occur on the refuge and allows for a more realistic depiction of impacts.

THE WILDERNESS SOCIETY

February 10, 1986

Regional Director
Attn: Bill Knauer
Fish and Wildlife
Service
1011 East Tudor Rd.
Anchorage, AK 99503

RE: Yukon Flats National Wildlife Refuge Draft
Comprehensive Conservation Plan

Dear Sir:

The following comments are submitted on behalf of The Wilderness Society's 150,000 members nationwide, including 1,400 in Alaska. For over 50 years, the Society has been committed to the wise management of the federal lands and the preservation of wilderness.

The Society has commented on the comprehensive conservation plans for several of Alaska's national wildlife refuges. Many of the problems identified in those comments are pertinent to the Yukon Flats refuge and should be incorporated as appropriate. However these comments will focus on two of the most egregious problems in the plan.

Inadequate Wilderness Recommendation

The Wilderness Society has already gone on record in protest of the March 12, 1985 policy directive from the Director of the Fish and Wildlife Service (FWS) to the Alaska Regional Director regarding the agency's wilderness recommendations. The Society believes this policy to be a gross misinterpretation of the Alaska National Interest Lands Conservation Act (ANILCA), and a violation of the explicit intent of Congress as expressed in section 1317 of that Act. (For a comprehensive discussion of the Society's objections to the policy, please refer to the letter, dated April 4, 1985, from Charles M. Clusen to Robert A. Jantzen.)

The comprehensive conservation plan (CCP) for the Yukon Flats National Wildlife Refuge (NWR) is the first to emerge from the FWS bearing the deep scars from the full effect of this anti-wilderness policy. As such, The Wilderness

ALASKA REGION

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(907) 272-9453

Society strenuously objects to the less-than-minimal wilderness recommendation proposed in the preferred alternative.

The plan itself states that the entire 8.5 million refuge acres are suitable for inclusion in the National Wilderness Preservation System, yet recommends only 650,000 acres, a paltry 8 percent, of this invaluable wildlife habitat. The FWS does not even try to provide a reasonable justification for this outcome. Its irrationality is further emphasized by the proposal to place the rest of the refuge in minimal management.

The Wilderness Society urges the FWS to repeal the March 12th "no-more wilderness" policy and recommend the entire Yukon Flats NWR for wilderness designation.

Oil and Gas Development Policy

At the outset The Wilderness Society takes exception to the virtually incomprehensible process regarding an "initial compatibility determination" outlined in the cover letter accompanying the CCP supplement. The procedure to be followed is not only indecipherable, but appears to have no basis in law.

The whole approach of the FWS toward oil and gas exploration and development is misguided and in violation of the letter and spirit of the Alaska Lands Act. According to ANILCA section 1008, no such program should be undertaken until after the entire CCP and wilderness recommendation processes have been completed. Moreover intelligent decisions cannot possibly be made as to the compatibility of oil and gas activities with refuge purposes in the absence of adequate information. It was the need for such a database to guide refuge planning that led to the enactment of ANILCA section 304 (g)(2). The "Affected Environment" section the Yukon Flats CCP loudly declares the severe lack of information under which the FWS is laboring. Since the FWS has failed to meet the information requirements of section 304, any commitments of resources at this time would be premature, inappropriate, and in violation of law.

The site-specific approach to compatibility determinations to allow exploration also conflicts with the mandates of ANILCA and the National Environmental Policy Act (NEPA). This narrow approach will provide neither assessment of the cumulative impacts of exploration around the refuge, nor consideration of the consequences of leasing and development. Exploration is an integral part of a development program and cannot be divorced from it for the purposes of a compatibility determination.

The Wilderness Society urges the FWS to withdraw their oil and gas policy as manifested in the Yukon Flats CCP in order to bring the policy and the plan into compliance with the requirements of ANILCA and NEPA.

The Wilderness Society is extremely concerned about the FWS's excessive pro-development, anti-wilderness bias evidenced in the policies and plans governing Alaska's refuges. The Society hopes to see a change in direction at the FWS to ensure that the promise of the Alaska Lands Act is met.

Sincerely,

Susan Alexander
Regional Director

ARCO Alaska, Inc.
Post Office Box 100360
Anchorage, Alaska 99510-0360
Telephone 907 276 1215

February 7, 1986

Mr. Bill Knauer
Regional Director
U.S. Fish and Wildlife Service
1011 East Tudor Road
Anchorage, AK 99503

RE: Yukon Flats CCP/EIS Wilderness
Review and Supplement

Dear Mr. Knauer:

ARCO Alaska, Inc. has previewed this plan, and we have the following comments to make on this document. The Fish and Wildlife Service should be commended for preparing a comprehensive plan that offers reasonable allowances for multiple use of the Yukon Flats region. We are aware of the great amount of time and effort necessary for generating documents such as this. It is our assessment that wildlife resources are well-protected under each of the management alternatives.

While the BLM's oil and gas resource assessment of the Refuge is a useful tool in making initial decisions about resource potential, absent seismic surveys and test wells, there is no adequate way to truly assess the subsurface potential. We believe that such means must be employed to provide the information necessary to perform an accurate national interest determination.

As stated in the Regional Director's cover letter, the focus of the Draft Supplement is on the impacts of geological/geophysical exploration and leasing. It appears that these impacts have been consistently overstated in this document. Some of the perceived impacts are incorrect because the operations mentioned are no longer in use by the industry. Even more distressing is the failure of the Supplement to acknowledge that there is a comprehensive network of state and federal regulations which specifically address each of the listed impacts and mandate either mitigation or, in some cases, prohibition of actions creating the impact. In addition, the history of oil and gas exploration and production in Alaska and the experience gained from regulation of operations in the Cook Inlet region, in offshore waters, and in the Arctic seem to be ignored in the discussion of impacts. Consequently, it appears that any compatibility determination of oil and

gas operations in the Yukon Flats NWR may be unfairly biased by the inaccurate information contained in the Draft Supplement.

We fully agree that activities conducted in accordance with regulations and stipulations, should result in no significant sacrifices of long-term productivity on the Refuge. In closing, we would urge that consideration be given to Alternative B, which we believe makes the best and most balanced use of the Yukon Flats region while still preserving the majority of the Refuge in a minimal-management status.

We thank you for the opportunity to present our views and comments on the Yukon Flats Draft CCP/EIS/WR and Supplement documents. We hope to be of some assistance as the plans for Yukon Flats are completed.

Yours very truly,

Richard Ogar

Richard Ogar
Consultant
Issue Advocacy

RO101:sm

FEBRUARY 8, 1986

MR. WILLIAM KNAUER
US FISH AND WILDLIFE SERVICE
REGION 7
1011 EAST TUDOR ROAD
ANCHORAGE, ALASKA 99503

DEAR MR. KNAUER:

I HAVE JUST COMPLETED READING THE YUKON FLATS NATIONAL WILDLIFE REFUGE PLAN, AND OFFER THE FOLLOWING COMMENTS. IT IS QUESTIONABLE WHETHER OR NOT THESE COMMENTS WILL REACH YOUR OFFICE IN TIME FOR INCLUSION TO THE FINAL REPORT, BUT I OFFER THEM ANYWAY.

I SPENT 10 MONTHS IN FT. YUKON LAST YEAR, AS THE LOCAL WELFARE WORKER FOR THE VILLAGES (EXCEPT RAMPART AND CIRCLE) THAT ARE INCLUDED IN THE YUKON FLATS REGION. SO IF MY COMMENTS APPEAR TO FAVOR THE SUBSISTANCE ISSUE, THAT IS ONE EXPLANATION.

THIS REGION, AS YOUR TEAM FOUND OUT, IS EXTREMELY POOR IN RELATIVE WHITE MAN'S TERMS. THERE IS A 'CASH FLOW', AND SOME OF IT INDEED DOES COME FROM SEASONAL HIRING ON VARIOUS PROJECTS, AND ONGOING EMPLOYMENT ON A VERY LIMITED SCALE BY THE SCHOOL DISTRICT AND LOCAL GOVERNMENT ENTITIES, PLUS SOME FROM TANANA CHIEFS CONFERENCE AND DOYON. BUT IT WAS MY EXPERIENCE, THAT MOST OF THE MONEY THAT FLOWED INTO THESE COMMUNITIES CAME FROM WELARE AND FOOD STAMPS. THIS IS A VERY SAD TRUISM. MOST OF THE PEOPLE I TALKED TO WERE VERY DEPENDENT UPON THAT SYSTEM AND THEIR CONCEPT OF SUBSISTANCE, AND THEY USED THE WILDLIFE RESOURCES TO SUPPLEMENT THEIR VERY BASIC NEEDS. FROM FIRST HAND KNOWLEDGE IT IS THEREFORE MY OPINION THAT PRIORITY MUST BE GIVEN TO THE NATIVE PEOPLES OF THIS REGION TO THE NATURAL RESOURCES THAT ARE A PART OF THE REFUGE AND THEIR HERITAGE.

THERE ARE SOME PEOPLE WHO DO NOT ABIDE BY THE HUNTING SEASONS AS SET ASIDE BY ALASKA FISH AND GAME AND FEDERAL REGS. IRONICALLY, THE TIME WHEN THE PEOPLE ARE AT THEIR VERY POOREST, IS THE TIME WHEN HUNTING IS CURTAILED, BECAUSE OF THE NEED TO PRESERVE THE YOUNG UNBORN IN THE SPRING OF THE YEAR. I RECALL HEARING SHOTGUNS BEING FIRED IN APRIL AND MAY, IN THE FLATS. OBVIOUSLY PEOPLE WERE BIRD HUNTING - WATERFOWL. BUT THEY WERE ALSO HUNGRY FOR FRESH MEAT - AND THE MEANS WAS THERE TO ACQUIRE IT. TRYING TO ADDRESS THE VERY COMPLEX ISSUES OF RESOURCE USE BY THESE PEOPLE, IN TERMS SET FORTH BY WASHINGTON DC AND THE VARIOUS BUREAUCRATS OF THE MANY AGENCIES, IS ABSURD. HOW DOES ONE BUY MILK AT $5.90 A GALLON AND MEAT AT $10.98 A LB. WITH FOOD STAMPS AND WELFARE? SHOTGUN SHELLS ARE A LOT CHEAPER, AND THE FRESH MEAT BETTER THAN THAT PURCHASED IN ANY OF THE LOCAL STORES.

I FOUND HUNTING OUT OF SEASON DISTURBING - BUT I HAD TO FACE THE REALITY OF THE FACTS AS I SAW THEM - AS THEY TRULY EXISTED. THERE WAS PROBABLY NO ONE ELSE IN THE VILLAGE WHO KNEW AS MUCH ABOUT THE FINANCES OF MOST OF THE PEOPLE IN THE VILLAGES AS I DID. THAT WAS MY BUSINESS - AND I CAN ASSURE YOU THAT THEY ARE EXCEEDINGLY POOR, AND THE COST OF FOOD EXTREMELY HIGH. IT TAKES MONEY TO LIVE - EVEN IN THE REMOTE VILLAGES OF INTERIOR ALASKA. IF THE MONEY IS NOT THERE TO BUY THE PRODUCTS AND FOOD NEEDED, THEN THEY WILL BE GOTTEN ANOTHER WAY.

THERE APPEARED TO BE GENERAL CONCERN ABOUT GAS AND OIL EXPLORATION ON THE REFUGE DISTRUBING AND DESTROYING WILDLIFE AND THEIR HABITAT. I AGREE WITH THAT CONCERN. I SEE WHAT HAS OCCURRED ON THE KENAI NATIONAL WILDLIFE REFUGE, AND KNOW THAT THE SAME CAN HAPPEN THERE. FLYING OVER THE FLATS, AS I HAVE ON MANY, MANY OCCASIONS, I SEE THAT THE AREA IS TRULY A FLOOD PLAIN, AND MANY OF THE LAKES ARE CONNECTED TO EACH OTHER BY SMALL STREAMS, STREAMBEDS AND SWAMPY AREAS. IT DEPICTS A VERY FRAGILE ENVIRONMENT - ONE THAT NEEDS TO BE PROTECTED, AND PROTECTED VERY WELL.

THE YUKON FLATS WILDLIFE REFUGE MUST BE PRESERVED AND PROTECTED FOR THE NATIVE PEOPLES OF THE REGION. THEY ARE AFTERALL, THE PRIMARY BENEFICIARIES OF THIS LAND THAT WAS ONCE ALL THEIRS; SOME 20,000+ YEARS WORTH. AIRPLANE ACCESS FOR HUNTING AND TRAPPING SHOULD BE EXPLICITLY ADDRESSED. MOST OF THE PEOPLE WHO DO HUNT AND TRAP CANNOT AFFORD AIRPLANE ACCESS. SO IT IS ASSUMED THAT MOST HUNTING AND TRAPPING THAT WOULD OCCUR IN THIS MANNER COULD BE CONSIDERED 'RECREATIONAL', AND THEREFORE NOT SUBSISTANCE IN NATURE.

IN CLOSING I WOULD LIKE YOU TO KNOW THAT I SUPPORT ALTERNATIVE E, AS OUTLINED IN THE DRAFT. I HOPE YOU WILL ACCEPT THESE COMMENTS NOT AS CRITICISMS, BUT RATHER AS VALUABLE INPUT FROM ANOTHER PERSPECTIVE, BY SOMEONE WHO HAS LIVED THERE.

SINCERELY,

SUZANN BUSH
260 SUSAN STREET
EUGENE, OREGON 97404

SDB:S

Robert Gilmore
Regional Director
U.S. Fish and Wildlife Service
1011 East Tudor Rd
Anchorage Ak 99503

Feb. 7, 1986

Re: Draft Comprehensive Conservation Plan for Yukon Flats National Wildlife Refuge Comments

Dear Mr Gilmore:

These comments are directed to the USFWS draft Comprehensive Conservation Plan for the Yukon Flats National Wildlife Refuge:

a) The USFWS is obligated by ANILCA to designate appropriate areas of the Refuge for Wilderness designation by Congress (by recommendation). The draft utterly fails to take into account the wilderness value and appropriateness of the entire Refuge by its recommendation of a more 8% as wilderness.

b) Oil and gas exploration must be limited to areas of intensive management in the Refuge.

Silmore (2)
Yukon Flats

c) No oil and gas development may go forward unless and until it is determined to be compatible with the enabling purposes of the Refuge, regardless of what the Secretary of Energy says.

d) Finally, resist pressure from the State of Alaska over RS 2477 rights of way. No RS 2477 rights of way should be reflected on the draft or any other plan for the Refuge. Let the state (and Joe Vogler), go to Court.

Thank you for your attention and consideration of my comments.

Daniel L Callahan
P. O. Box 1621
Fairbanks, AK 99707

UNIVERSITY OF ALASKA

January 22, 1986

Regional Director
U.S. Fish and Wildlife Service
1011 E. Tudor Road
Anchorage, Alaska 99503
Attn: Mr. Bill Knauer

Dear Sir:

I am writing to comment on the portion of the Yukon Flats National Wildlife Refuge draft Comprehensive Conservation Plan which refers to subsistence use and management. I was involved in preparation of two reports documenting the nature and spatial distribution of subsistence activities for the communities of Arctic Village, Birch Creek, Chalkyitsik, Fort Yukon and Venetie (Caulfield, 1983) and for Circle (Caulfield, 1979), both of which are cited in the draft. On page 82 of the draft, these reports are cited as primary sources for information on subsistence activities by residents of these communities.

1 I am pleased that these reports were useful to the planning team. However, accurate interpretation of the data contained in the reports requires that several important qualifications be added to both the draft plan's text regarding subsistence use and to the maps drawn from my 1983 report. Specifically, each map depicting subsistence land use by community (in Caulfield, 1983) contained a qualifier which stated both that land use areas were compiled from a sample of community households, that additional mapping might expand the limits of this use area, and that subsistence uses were dynamic and subject to change.

For example, the sample size for mapping interviews in Fort Yukon was quite small (see the section on methodology in the 1983 report); additional information drawn from other sources made it clear that important subsistence use areas for Fort Yukon--specifically the area in the vicinity of Alexander's Village and "Shovun"--were not included in that community's maps (1983:157). To ensure accuracy in the interpretation of this data, I believe that each map in the draft plan which uses data from the 1983 report should contain the same qualifier which appears on the original map in the 1983 report.

PLEASE REPLY BY AIRMAIL

1 Furthermore, subsistence research conducted in the Yukon Flats has determined that resource harvest patterns are influenced by a variety of factors including resource dynamics, changes in local economies, and government regulations. Chapter 10 of the 1983 report discusses the dynamic nature of subsistence land and resource use in the region (see also Nelson, 1973). The section on subsistence in the draft plan could be strengthened by refering to these factors and to the role of subsistence harvests play in the mixed subsistence/cash economy of the region.

2 Finally, no mention is made in the draft plan of a report compiled by the Alaska Department of Fish and Game, Subsistence Division regarding Native place names in the region (Technical Paper Number 83; 1983). The report documents Native names for geographical and other features in significant portions of the refuge and provides important data about land and resource use patterns. It should be referenced and discussed in the draft plan. Copies should be available from the Division of Subsistence or from the Alaska Native Language Center at the University of Alaska, Fairbanks.

I appreciate the opportunity to comment on the draft plan. If I can provide any additional information or clarification, please contact me.

Sincerely,

Richard A. Caulfield
Instructor of Rural Development
Bristol Bay Rural Development Program
P.O. Box 10206
Dillingham, AK 99576
842-1008

Response to Richard A. Caulfield.

1. **Notes have been added to the appropriate maps indicating that the information depicted is based on a sample of the population of the community and that additional mapping might expand the limits of the use area. In addition, a discussion of the dynamics of subsistence land and resource use in the region has been added to the discussion of subsistence use on the refuge.**

2. **We are aware of the document to which you refer and find the document of interest. However, the information presented in the document does not add to the body of information necessary to formulate the broad management objectives presented in the plan. This information may be of more value during the next phase of planning, the step-down management plans, where site-specific information will be of more value.**

Chevron U.S.A. Inc.
3001 C Street, Anchorage, AK 99510
Mail Address P.O. Box 107839, Anchorage, AK 99510 Phone (907) 786 6800

Land Department

February 10, 1986

Draft CCP/EIS and
Wilderness Review
Yukon Flats Wildlife
Refuge, Alaska

Regional Director
Fish and Wildlife Service
1011 E. Tudor Road
Anchorage, AK 99503

Attention: Mr. Bill Knauer

Gentlemen:

We appreciate the opportunity to make comments on the subject draft.

The petroleum potential of the Yukon Flats NWR has not been properly evaluated due to the oil and gas exploration moratoria imposed on the refuge by native claims review, wilderness studies and DOI mandates. Chevron favors implementation of refuge management alternative B or a modified version of alternative B which would allow oil and gas exploration throughout much of the reserve and oil and gas leasing in the south-central portion of the refuge (approximately 43% of lands managed in the Yukon Flats NWR). We believe implementation of the above alternative would be in the national interest by: 1) allowing proper evaluation of the oil and gas resource potential of this "potentially favorable petroleum geology province"; and 2) providing for multiple compatible uses of land within the Refuge.

The oil and gas industry has demonstrated in over thirty years of activity within the Kenai Moose Range and more recently in the Arctic NWR that petroleum operations, when properly conducted, have only a minimal, local and temporary impact on the refuge's environment and on other refuge users.

Multiple-use management of the non-wilderness portions of the refuge should be encouraged. It is in the nation's and Alaska's best interest that the oil and gas potential of the Yukon Flats NWR be adequately evaluated.

Very truly yours,

W C Morrison

WCM:blp

386

D. J. COOLIDGE
ARCHITECT
BOX 1720
WASILLA, ALASKA 99687
(907) 745-3251

NATIONAL WILDLIFE FEDERATION
CONSERVE WILDLIFE
BE A CONSERVATIONIST
WHOOPING CRANE

10 FEB 86
FISH & WILDLIFE SERVICE
1011 EA. TUDOR ROAD
ANCHORAGE AK. 99503

SIRS:
PLEASE BE SURE TO RECOMMEND THE ENTIRE YUKON NATIONAL WILDLIFE REFUGE TO BE INCLUDED IN THE NATIONAL WILDERNESS PRESERVATION SYSTEM!
WE NEED ALL THE WILDERNESS WE CAN GET HERE IN ALASKA! OUR LAST CHANCE!
OIL & OTHER MINERAL EXPLORATION & DEVELOPMENT SHOULD NEVER BE DONE ON WILDERNESS LANDS UNLESS & UNTIL DIRE NATIONAL NEED, SUCH AS WAR OR "ZERO" OIL IN ALL OTHER AREAS, FOR ENERGY NEEDS.
I HAVE A HOMESTEAD ON THE KENAI PENINSULA ("PROVED" IN 1953) WHICH WAS BUTCHERED BY WESTERN GEOPHYSICAL & STANDARD OIL OF CALIF. IN THE FIRST CRAZED, HURRIED SEISMIC WORK DOWN THERE — SO I KNOW FROM EXPERIENCE HOW IRREPARABLE DAMAGE CAN BE DONE TO "WILDERNESS" BY UNCARING & UNCOORDINATED "DEVELOPERS".
THANKS FOR "LISTENING" —

D. J. Coolidge
35-YEAR RESIDENT.

COPY: STEVENS, MURKOWSKI, YOUNG } 3 MUSKETEERS, WASHINGTON, D.C.

2636 Freeman Rd.
North Pole, AK 99705
2/8/86

Robert Gilmore
Regional Director
U.S. Fish and Wildlife Service
1011 E. Tudor Rd.
Anchorage, AK 99503

Dear Mr. Gilmore:

I am writing to express my dismay at the prospect of the Yukon Flats National Wildlife Refuge being opened for oil and gas exploration. If it occurs at all, it should be only in intensive management areas.

The Secretary of Energy is not the person who should decide what is to be in the "national interest" for his opinions to supercede the intent of ANILCA is ridiculous. The wilderness values of the area should be protected with every possible precaution forever! Let's face it - those who wish to develop, for whatever reason, will use any scheme considerable to "work over" wilderness areas. They need to be protected by laws which are inviolable. I hope you will work hard to protect them.

Sincerely,

Helen M. Drury

387

Kenneth Emmel
Anchorage, Alaska
25 January 1986

Regional Director
U.S. Fish & Wildlife Service
1011 East Tudor Road
Anchorage, AK 99503

Subject: Yukon Flats NWR Comprehensive Conservation Plan

Dear Mr. Knauer:

I am opposed to wolf control on the Yukon Flats NWR in any shape or form. I feel that most animals are being overharvested by people and wolves are being given the blame. I don't think that individuals need to be taking 3 black bears, 5 caribou, 15 grouse, and 20 ptarmigan per day. No limits on racoons, squirrels, hares, and wolves, just encourages poaching. Bag "limits" set by the Alaska Department of Fish & Game are far too liberal and it is up to the U.S. Fish & Wildlife Service to put some conservation into the management of wildlife on a national wildlife refuge. I have serious doubts that airplane hunting of wolves is going to increase the moose population. Abuse of wildlife and technology has been a common occurrence in Alaska for some time. I favor management for a diversity of animals and not farming out certain more popular species. Habitat manipulation may be okay to some extent, but should not be done at the expense of valuable predators whose numbers are dwindling.

Sincerely,

Kenneth Emmel

EXXON COMPANY, U.S.A.
POST OFFICE BOX 4279 • HOUSTON, TEXAS 77210

EXPLORATION DEPARTMENT
ALASKA/PACIFIC DIVISION

E. D. STUART
MANAGER

February 7, 1986

Mr. Robert E. Gilmore
Regional Director
Fish and Wildlife Service
1011 East Tudor Road
Anchorage, Alaska 99503

Dear Mr. Gilmore:

Exxon Company, U.S.A., a division of Exxon Corporation, is pleased to comment on the Draft Comprehensive Conservation Plan/ Environmental Impact Statement/Wilderness Review and Supplement for the Yukon Flats National Wildlife Refuge. The Yukon Flats plan is the most balanced in approach to wildlife protection and consideration of other refuge resources of any of the plans to date, and we commend the Service's efforts to implement the oil and gas provisions of the Alaska National Interest Lands Conservation Act (ANILCA) Section 1008.

We believe that the Yukon Flats Refuge mineral potential should be evaluated, and we urge the Service to adopt Alternative B rather than Alternative D as its preferred alternative. Alternative B fulfills all of ANILCA's wildlife refuge objectives: protection and enhancement of refuge wildlife values, while permitting use of the other refuge resources compatibly with refuge purposes. We believe Alternative B is particularly appropriate given that the proposed intensive and moderate management areas are adjacent to the extensive native inholdings within the refuge. Congress attempted to ensure the economic success of Alaska's people by enacting the Alaska Native Claims Settlement Act, and permitting native corporations to manage their resource base as they saw fit. Alternative B's intensive and moderate management areas around these inholdings furthers this congressional intent, is consistent with the Service's commitment to cooperation with private landowners' use of their property, and protects overall federal and state interests.

We appreciate the amount of time and effort involved in evaluating refuge values to create a workable conservation plan and recognize the difficulties inherent in implementing the exacting standards of the National Wildlife Refuge System Administration Act and ANILCA. It is clear, however, that both the

Refuge Act and ANILCA authorize oil and gas leasing in refuges. In addition, Section 1008 of ANILCA directs the Secretary of the Interior to establish an oil and gas leasing program for all non-North Slope federal lands. Refuges are not to be excluded from Section 1008 unless the Secretary determines, after consideration of the national interest, that leasing would be incompatible with primary refuge purposes.

Exxon believes that the Draft CCP's discussion of the impacts from oil and gas leasing of intensive and moderate management areas under Alternative B establishes that leasing can occur compatibly with the Yukon Flats' primary purposes. "Compatible" is defined as "capable of existing or operating together in harmony," Webster's Ninth New Collegiate Dictionary, 1984. Nowhere does the Draft CCP demonstrate that leasing in moderate and intensive management areas is other than capable of existing in harmony with other refuge resources. To the contrary, the Draft CCP finds that most impacts from such leasing can be mitigated to the point of being negligible or nonexistent. Since the document itself finds that leasing of moderate and intensive management areas is compatible with refuge resources, no national interest inquiry is necessary prior to leasing of these areas.

We also firmly believe that exploration and development conducted under appropriate stipulations and mitigating conditions can occur compatibly even in the minimal management areas, where the leasing decision must await Secretarial consideration of the national interest.

The following overview of the detailed comments contained in Attachments A-C highlights Exxon's major concerns with the Service's Yukon Flats Draft CCP and current oil and gas leasing policy.

Thank you for this opportunity to comment on the Draft CCP and Supplement for the Yukon Flats National Wildlife Refuge. We have provided an extra copy, in the event you care to share our comments with your Washington, D.C. office. We would be pleased to discuss any of these comments with you, and hope that they help not only in finalization of the CCP, but also in implementation of the FWS' oil and gas leasing policy pursuant to Section 1008 of ANILCA.

E. D. Stuart

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Attachments

OVERVIEW OF ATTACHMENTS A-C

A. Consideration of National Interest

Exxon believes that two aspects of the process proposed for adopting the Yukon Flats Draft CCP are either in conflict with the Service's oil and gas policy or the provisions of Section 1008 of ANILCA.

1 First, the Service's policy has made clear that the compatibility of oil and gas leasing will not be determined until information on the hydrocarbon resource potential of the refuge is obtained and the Secretary has considered the national interest in producing oil and gas from such lands. However, the Service's cover letter to the Supplement to the Draft CCP states that an "initial compatibility determination" will be made without the necessary resource information or consideration of the national interest. An initial determination of incompatibility would clearly be improper and inconsistent with the provisions of ANILCA. We would also add that it is grossly inefficient to make a meaningless compatibility determination now without the required information or considerations and before any interest in leasing the refuge has been expressed. Where it is clear from the CCP record that oil and gas development activities can be conducted compatibly, no national interest determination is necessary. Where such a compatibility determination cannot be made, such as in areas the Service proposes to designate as minimal management, the next appropriate step is to seek a national interest determination. Neither leasing nor a finding of incompatibility with respect to minimal management areas would occur until the Secretary has considered the national interest as outlined in ANILCA Section 1008. We would suggest that the Service revise its policy to clarify this procedure, and have included as

1 Attachment A to these comments a detailed exposition of the national interest factors which the Secretary should consider in the Section 1008 analysis.

2 Second, the Service's cover letter to the Supplement to the Draft CCP states that leasing of areas proposed for minimal management in all alternatives of the CCP will automatically be considered incompatible. We strongly believe that such an automatic determination at this point, without information on hydrocarbon potential or Secretarial consideration of the national interest, would violate Section 1008 of ANILCA. This law does not authorize "automatic incompatibility determinations," and any such determination would clearly be arbitrary and capricious. We would like to stress that we are not proposing that these lands be leased now. We are only requesting that the Service comply fully with the requirements of ANILCA and make a national interest determination before declaring any land to be "incompatible" for oil and gas leasing purposes.

3 The Draft CCP recognizes the oil and gas potential of this area in the statement (page 41) that "the Yukon and Kandik Basins together are believed to have the highest potential of all Alaska Interior Basins....." This potential is widely recognized, but very difficult to quantify until more is known from further exploration about basin fill, structuring, and thermal history. Although the Draft CCP section on minerals includes a map by Arlen Ehm showing the probable configuration of the Yukon Oil and Gas Basin (page 40), this map is primarily a compilation of magnetic and gravity data, limited by what is apparent from surface geology. These data are considered the most basic of reconnaissance techniques and are subject to considerable interpretation, which, as stated on page 39, has resulted in conflicting opinions. Arlen Ehm's map should be recognized as but one interpretation of many possible from the same data set.

3 Because later maps often bear little resemblance to the initial versions, it is expected that preliminary maps may change with the incorporation of more definitive data from subsequent exploration.

For these reasons, we urge that the Final CCP clearly state that Mr. Ehm's map is an interpretation, based on a very limited amount of preliminary data, and that revisions incorporating more definitive data may result in significant changes. It is particularly important that the probable basin boundaries on the map not be considered the only areas likely to have oil and gas potential. Any land use planning should consider the possibility of oil and gas potential elsewhere on the Yukon Flats National Wildlife Refuge.

B. The Exploration Process and Compatibility

We recognize that many people not familiar with the exploration and development process are concerned that any oil and gas activity necessarily leads to exploitation and misuse of other natural resources. An understanding of the actual normal course of exploration and development demonstrates that such uncontrolled development is not possible because of the stringent planning, review, and permitting procedures required. To illustrate that leasing can occur compatibly with refuge purposes in minimal management areas and to further support the Draft Plan's oil and gas compatibility findings in intensive and moderate management areas, we include as Attachment B a description of state-of-the-art exploration methods and mitigation techniques available at each step of the process.

C. Specific Comments

Exxon also has two specific comments on the management alternatives discussed in the CCP. Attachment C contains

additional specific comments addressing the summary of impacts on refuge resources from activities authorized under Alternative B and those under the Service's preferred Alternative D.

First, we believe it inappropriate to propose the strip along the southern boundary of the refuge for wilderness designation. This area is bounded by areas administered by the Bureau of Land Management under a multiple use mandate pursuant to ANILCA and the Federal Land Policy and Managment Act. The strip also borders state owned lands which may be developed. To create a barrier of inaccessible acreage given the characteristics of the surrounding areas can only result in inefficient and costly land use decisions in the future. The primitive and unique qualities of the White Mountains are adequately protected by the BLM's land management plan for the White Mountains National Recreation Area. The special qualities of this strip can be preserved without wilderness designation.

Second, we suggest that transmission lines, pipelines, access roads and certain vehicles, including at least all-terrain vehicles, be listed as permitted uses in the minimal management classification areas which surround moderate and intensive management areas. (Table 12 of Supplement to the Draft.) If development should occur in either native inholdings or in moderate or intensive management areas, such facilities will be necessary to permit full use of these lands and to transport any production from the refuge. For the same reasons, we suggest that Table 12 be revised to reflect that gravel removal is authorized for use <u>on</u> as well as off the refuge, and in moderate and minimal as well as intensive management areas.

CPB:bg.I

Attachment C

SPECIFIC COMMENTS
ON
YUKON FLATS DRAFT CCP/EIS/WR

The majority of Exxon's specific comments are directed to Table 19 of the Supplement to the Draft. As much as possible, we will follow the organization and topics presented in that table. Due to the overlapping nature of many of the elements evaluated, however, we will make some general observations prior to making specific comments.

First, we suggest that the Final CCP be written so that the casual reader of the document will have a more clear and realistic impression of the impacts that petroleum activity would have on the refuge.

4 Also, we hope the Final CCP provides significantly more facts than does the Draft. Specifically, we believe the Final must contain data or estimates regarding bear and caribou populations, number of refuge visitors, number of recreational days, dollars spent, etc. Absent these specifics, the CCP findings and recommendations are unsubstantiated and conclusory assumptions.

Finally, we suggest that the following paragraph found at p. 175 of the Draft CCP and p. 34 of the Supplement, be moved to the beginning of the Final Plan:

"MITIGATION

5 Adverse impacts resulting from the implementation of the Yukon Flats Refuge Comprehensive Conservation Plan will be mitigated whenever and wherever possible, relative to the goals and objectives of the plan being implemented. The Service will

5 promulgate regulations, develop stipulations, and issue permits to mitigate other impacts. These regulations, stipulations, and permits will mitigate impacts by a variety of means: avoiding the impact altogether; minimizing the impact by limiting the degree or magnitude of the action; rehabilitating or restoring the affected environment; and compensating for the impact by replacing or providing substitute resources or environments. Mitigation may consist of standard stipulations, such as those attached to oil and gas leases; special stipulations which may be attached to various types of leases on a site-specific basis; and site-specific, project-specific mitigation identified through detailed step-down management plans or the environmental assessment process. The degree, type, and extent of mitigation undertaken will depend on the site-specific conditions present and the management goals and objectives of the action being implemented."

Since this mitigation concept is such an integral part of refuge management it should receive appropriate attention in the final document.

Our specific comments are limited to the Supplement's Table 19 comparison of impacts under Alternative B, Exxon's preferred maximum use Alternative, with those under Alternative D, the Service's minimal use alternative.

WILDLIFE

General

We do not believe the Draft CCP proves that there will be "Significant Impacts to Species and Habitats in Areas of Development" due to petroleum activity. Negative impacts, if any, may be minor, temporary, and local. Regulation of petroleum activities will further minimize any potential impacts. Enhancement measures can actually provide positive impacts. Through proper controls on activities, all species and habitats can be as protected under Alternative B as under Alternative D.

Even "good" activities or "good" uses can have unexpected and undesirable impacts. The FWS site-specific compatibility determinations should be based on concepts such as "performance standards" and/or "carrying capacity" of the resource. Exxon has long espoused this approach. We suggest this approach be applied to all proposed refuge activities and uses as a means to scientifically determine permitted activities and uses. Performance standards are designed to achieve certain results, but do not dictate how the objectives are to be reached. This approach maximizes flexibility in operations for all parties.

6 The Draft CCP frequently mentions the FWS "Surface Protection Criteria" and "Stipulations for Surface Disturbing Activities." Exxon urges that the Final CCP describe these criteria and stipulations.

392

Waterfowl

7 Alternative D states that "Waterfowl species and habitats will be protected to preserve natural diversity." Alternative D also states that no adverse impacts will occur if seismic activities occur in winter. We believe both of these conclusions are valid. They are equally valid for Alternative B.

Alternative B states that "Oil and gas leasing and associated development could adversely affect up to 47% of the wetland habitat." We believe that there is no basis for this conclusion for several reasons.

7

a. Regulations and site-specific stipulations will control petroleum activity and prevent adverse effects.

b. The projected area of adverse impacts is unreasonable. The Yukon Flats Refuge encompasses approximately 8,472,000 acres. Forty-eight percent is classified wetlands habitat. Forty-seven percent of wetlands habitat amounts to 1,900,000 acres (2,986 square miles). This is more than one-half the size of the state of Connecticut. By no stretch of the imagination would seismic lines or wells destroy or adversely affect an area this size.

c. The Draft CCP mentions seismic work done in the 1950's and 1960's (page 39) and three nearby wildcat wells drilled in the late 1970's (page 41). Most of these activities occurred prior to the current environmental awareness and resulting regulation. We believe a description of the impacts to the environment from such activities prior to environmental controls illustrates a "worst-case" scenario which simply could not recur in today's regulatory climate, operating with state-of-the-art technology and equipment.

d. The discussion on waterfowl (page 55) concludes that the total duck population in the refuge is 1,606,800 ducks. If the duck population was spread evenly over the refuge and inholdings of 11,172,000 acres, there would be almost seven acres per duck. Assuming a maximum of 100 ducks per square mile (Figure 13), there would be about six acres per duck in the most populated areas. By comparison, an exploration well would occupy about five acres for

7 maximum of five or six months. Since the duck population is most likely concentrated rather than dispersed, we believe that conflicts are unlikely. Moreover, the refuge birds listed in the Draft CCP (at Appendix D) have demonstrated innumerable times and in countless locations that they can, and do, coexist successfully with petroleum activities.

Since we believe there is no significant difference between Alternatives B and D for waterfowl, we urge that the Final CCP conclusions in Alternative B be revised to this effect.

Moose

8 We believe that the statement found in Alternative D is equally valid for Alternative B. The impacts on moose from regulated seismic activities are negligible compared to the effects of prescribed fire management and water axing. We also object to the implication that oil and gas activities in the Yukon Flats refuge will lead to "improved access" and increased harvest, especially since the CCP's access provisions are so limited. We find no substantiation for the apparent correlation between oil and gas activity and increased harvest by hunters or subsistence users. Finally, the Kenai NWR provides ample evidence of the compatibility of moose and petroleum activities.

Caribou

9 Caribou populations, migration patterns, and habitats will be carefully protected by regulations which may be based on the extensive caribou/oil studies done elsewhere in Alaska, such that Alternative B's result will not differ from that of Alternative D. Again, any increased harvests of caribou, like those of moose, will not be direct results of oil and gas activities. For example, there is no evidence that exploration occurring in the ANWR has led to increased harvests of caribou.

Bear

10 The Draft CCP description of bears found on page 65 consists of two short paragraphs. In neither of these two paragraphs, nor elsewhere in the Draft, do we find any estimates of bear population. Without these estimates, it is difficult to understand the basis for a "significant increase in bear/human conflicts" conclusion. Most petroleum related activity involves small clusters of humans. Bears tend to avoid such groups. Also, seismic activity conducted in winter months during the black bear denning period would further reduce any potential bear/human contact.

We believe Alternative D's finding of "negligible" impact on bears is equally applicable to the impacts on bears from oil and gas activities under Alternative B. The CCP contains no evidence to support its conclusion that petroleum activities "significantly" affect bears.

Fur Bearers

11 We do not believe any petroleum activity impacts will measurably impact fur bearers, even on a localized basis. There is no information in the Draft CCP to the contrary.

Peregrine Falcons

12 Alternative B concludes that disruption of peregrines around nest sites may occur absent special stipulations. Since the FWS may impose special stipulations to protect these nest sites, the results of Alternative B should correspond to those projected for Alternative D.

We do not believe, however, that such special stipulations are necessary. According to the Draft at page 54, peregrine nests are associated with cliffs and bluffs near a few identified rivers. This is the type of area which we try to avoid since it is the most difficult for the conduct of petroleum-related activities.

We also believe the emphasis placed on peregrines is misleading. We note (page 54) that only two known nesting sites occur within the refuge. It is unlikely that petroleum activities over the 8 million acre refuge would have any impact on these two nesting sites.

To our knowledge, none of the peregrine subspecies present in Alaska has ever been biologically endangered. In all probability, the peregrine population remains at historic levels.

Fisheries

Please see our discussion under "Water Quantity/Quality".

VEGETATION

13 Seismic exploration has been conducted on the North Slope for some 40 years. There is no doubt that the early activities, conducted during the summer months, had some adverse impacts on the environment. Much has been learned since then, however, and impacts from petroleum activity have decreased substantially. Stipulations addressing type of energy source, traffic pattern, routing of vehicles, location of campsites and airstrips and handling of fuel, have been used successfully in the Arctic Natural Wildlife Refuge to further minimize vegetative, thermal and visual impacts.

Exxon believes it is misleading and inappropriate to imply that the impacts on vegetation from fire and seismic activity are equivalent. The caption under the picture on page 47 of the Draft CCP reads: "Fire, primarily the result of natural causes, has played a major role in creating the vegetation patterns found on the refuge." The real significance of fires is stated on page 20 of the Supplement: roughly 1,200,000 acres have burned over the past 20 years. This averages 60,000 acres or about 95 square miles per year. The acreage burned in the last 20 years is approximately 14 percent of the entire refuge.

We point this out because the Draft CCP concludes that virtually all of the refuge acreage is suitable for wilderness designation. We assume this includes the acreage affected by fire. Petroleum activity would not affect

13 vegetation to the extent of 60,000 acres per year. Also, we do not understand why acreage undergoing regrowth following petroleum activities would be ineligible for wilderness designation, when acreage burned, harvested or otherwise manipulated would be eligible.

We agree that controlled manipulation of vegetation is beneficial for purposes of the refuge. We disagree, however, with the statements which assume that seismic activities require clearing or otherwise destroying vegetation. Seismic activity occurring during the winter causes minimal impacts on vegetation and succession.

WATER QUANTITY/QUALITY

14 We believe it appropriate to discuss fisheries with water quantity/quality due to the interrelated nature of these two elements. It is Exxon's opinion that the text contains serious errors about the potential impact of petroleum activities on water resources.

On page 161, we find that Alternative B could, "...potentially result in significant impacts to the fisheries resources." On page 164, we find, "Even with stringent regulations there could be major localized short-term impacts on water quality and quantity from these activities." The latter sentence refers to the potential "water withdrawals of up to 8.4 million gallons per deep well." The fear is expressed that this withdrawal could deplete ponds and streams adjacent to the areas of development. In reality, most of any water employed in petroleum activity is borrowed and then returned to its source.

14 Even assuming that all of the 8.4 million gallons per deep well of water were consumed rather than returned to the system, the impact would be insignificant. The Draft CCP states on page 31 that approximately 6.5 inches of precipitation occur each year. Converting this to gallons, each acre receives approximately 176,000 gallons of water each year. Further calculation shows that it would take the precipitation of only 47 acres to provide all the fresh water needed for a deep well. Forty-seven acres is approximately 0.00000056 percent of the entire refuge. We do not believe that even if the water were consumed, rather than used, the consumption would have a significant impact on either water quantity or fisheries.

Nor do we believe that water quality would suffer from petroleum activities. The Draft CCP describes the Yukon River as turbid, but provides no supporting data. Regulations could ensure that the quality of returned water meets or exceeds ambient parameters. It is unrealistic to assume that petroleum activity would affect many of the 40,000 lakes and ponds which exist on the refuge.

15 Seismic activities conducted primarily in the winter would eliminate most or all concerns about damage to stream banks, stream beds, overfishing, turbidity, dust, vegetation, soil surface disturbance, erosion, alteration of soil thermal regimes and alteration of drainage patterns.

16 Most wildlife managers recognize that fish and wildlife population cycles are natural occurrences, and that if impacts from proposed projects do not cause population cycles to swing beyond their normal range there is no cause for concern. Table F-4 (page 218) shows that 102,381 salmon were harvested

16 commercially in the refuge in 1981. The following year, 1982, the harvest fell to 19,291 salmon. No anticipated petroleum activity would cause such a significant drop in catch, and thus would not alter population cycles beyond the norm.

VISUAL/AIR QUALITY

We believe that regulated seismic activities will have negligible impacts on both air quality and visual aesthetics.

POPULATION

17 Page 166 concludes that, "Implementation of Alternative B could result in a significant increase in the population of communities in or near the refuge". Part of this projected increase is attributed to increased access as a result of seismic activity. Neither increased population nor increased access are inevitable results of implementation of Alternative B, however.

Each seismic crew comprises 30-60 individuals. The number of crews deployed at any one time in the refuge will partially depend upon the number of seasons (winter and/or summer) and years allowed for the particular activity. Any negative impacts on "population" from seismic or other petroleum activity would be temporary and mitigable through use of environmental training programs.

We also believe that the use of the adjective "significant" is misleading. A typical seismic crew of 30-60 individuals represents only approximately two

17 and one-half percent of the existing population. We do not believe that this temporary increase, in absolute numbers or as a percentage, is significant. Furthermore, any population increase would be spread over an area approximately three and one-half times the size of the state of Connecticut.

Finally, we fail to see the basis for the correlation between the Draft CCP's "projected improved access" between communities and seismic activity (p. 167). Only by pure chance will seismic lines connect communities.

SOCIAL

18 Alternative B concludes that moderate impacts to traditional lifestyles could result from improved access between villages and areas outside the refuge. We do not, however, see why improved access between villages and areas outside the refuge necessarily results from the oil and gas activity permitted under Alternative B. Most materials needed for early petroleum activity could use existing transportation facilities. Furthermore, although we urge that the Final CCP be corrected to allow access over the minimal management areas surrounding the intensive and moderate management areas, the Draft allows neither unimproved roads nor all terrain vehicles over minimal management areas under any of the alternatives. We therefore fail to see how access "improves" from Alternative D to Alternative B. Alternative B as well as Alternative D should find negligible impacts to traditional lifestyles as a result of improved access.

ECONOMY

19 Economic growth may accompany oil and gas development. According to page 77, it appears that some natives would appreciate this outcome. Such potential beneficial impacts from oil and gas activities should receive appropriate treatment in the Final CCP.

PUBLIC USE

20 Increases in public use would not result solely from the oil and gas activities permitted under Alternative B. Allowing greater recreational opportunities would also cause increased use.

CULTURAL RESOURCES

21 We believe that the summaries presented under both Alternatives B and D are unfair and inaccurate. Petroleum activity in the refuge would locate and preserve, not destroy, cultural resources. As stated on page 171, "Whenever and wherever possible, the Service would avoid or minimize impacts to cultural resources through site-specific inventories and evaluations and by the use of mitigation or preservation measures." Without these preservation measures, these undiscovered resources would be subject to disintegration by natural forces. Cultural resource surveys conducted in association with seismic surveys have a major beneficial impact which should receive appropriate emphasis.

WILDERNESS

22 We do not believe that any petroleum activity, or any other activity when properly regulated, could adversely affect 43 percent (not 47 percent) of the Yukon Flats refuge such that the area became unsuitable for wilderness designation. The text of the Draft CCP does not substantiate this conclusion, nor do we believe data exists that will. In fact, areas developed for oil and gas in the western states have been successfully reclaimed and subsequently designated as wilderness areas.

SUBSISTENCE

23 Both Alternatives B and D find that current opportunities for participation in traditional activities by local residents would be maintained. Unfortunately, Alternative B appears to present only the negative side of progress. Although conflicts with other users may increase under Alternative B, Exxon's preferred alternative would also allow private landowners greater freedom to develop their property as they saw fit.

CONCLUSION

In summary, Exxon believes the text of the Draft CCP does not present the data necessary to arrive at many of the findings and recommendations presented by the various Alternatives. The current conclusions are generally presented in a "worst-case" approach, are based on unreasonable assumptions, and do not consider required regulations, mitigating measures or project benefits.

Response to Exxon Company, U.S.A.

1. The Service has not included an initial incompatibility determination in the final plan. Oil and gas leasing and development would not be allowed on the refuge at this time under the Service's preferred alternative, Alternative D. Therefore, an incompatibility determination is not required at this time. Should future revisions of the plan identify areas of the refuge for inclusion in the intensive or moderate management categories - where oil and gas leasing and development could be allowed, an incompatibility determination would then be made using all data available to the Service at that time.

2. Your concern is noted. The current oil and gas exploration and leasing policy for national wildlife refuges in Alaska states that "(t)he Service will automatically consider oil and gas leasing to be incompatible with the purposes for which the refuge was established on those portions of the refuge that were designated as minimal management areas in all alternatives of the CCP."

3. Your concerns have been noted. The Yukon oil and gas basin configuration, as delineated by Arlen Ehm has been removed from Figure 7. In its place, information from Banet (1987) on the geologic potential for oil and gas discovery on the Yukon Flats Refuge has been added to the map.

4. We disagree. The information you believe needs to be incorporated into the final plan would only be speculative at best. We do not believe the lack of this information in the plan results in unsubstantiated and conclusionary assumptions.

   No census work has been done to determine the bear population on the refuge. Caribou currently are only infrequent users of (wintering areas, calving grounds) and migrators through the refuge, with numbers fluctuating significantly from one year to the next. However, the refuge has provided significant habitat for caribou in the past and could, as caribou herds expand in size, play a significant role in the future. Little information is available on the number of refuge visitors, recreational user days, and dollars spent. What records have been found indicate that refuge use by non-locals is a very small percentage of the total use on the refuge - less than 10 percent. To determine more precise figures would require a significant amount of time with the additional detail such information would provide being of little significance in the way the refuge would be managed.

5. Your concerns are noted. Additional discussion of mitigation has been added to the final plan.

6. Although the draft plan discusses stipulations, mitigation measures, and the regulation of use, we are unaware that the phrases "Surface Protection Criteria" or "Stipulations for Surface Disturbing Activities" are used in the document. Stipulations and mitigation measures that are discussed in the plan and would be used as necessary to regulate use on a site-specific basis include, but would not necessarily be limited to, avoiding the impact altogether, limiting the degree or magnitude of the action, rehabilitating or restoring the affected environment, and compensating for the impact by replacing or providing substitute resources or environments. Specific stipulations or mitigation measures will be applied on a site-specific, project-specific basis.

7. We disagree that there is no significant difference between Alternatives B and D relative to the potential impacts on waterfowl. Many of the impacts discussed, even with stipulations and mitigation, will occur. On-going studies in the Prudhoe Bay-Kuparuk area are showing that many impacts are continuing to occur even with stipulations and mitigations required by regulations. Developing oil and gas resources will result in the loss of habitat, utilization of water resources, and increased disturbance of waterfowl from human activities. Stipulations and mitigation cannot eliminate these impacts, they can only minimize them. Therefore, implementation of Alternative B would, in all probability, result in greater impacts to waterfowl populations and habitats than would implementation of Alternative D. Also see responses 4 and 6 to the Alaska Oil and Gas Association.

   Your discussion of waterfowl distribution on the refuge is interesting, however, you cannot uniformly distribute the waterfowl population equally across the refuge as not all of the refuge is waterfowl habitat. Waterfowl concentrate in certain areas of the refuge, namely the wetlands areas. As shown in Figure 13, there are significant areas of the refuge which support high populations of waterfowl, in excess of 100 birds per square mile when considering total population.

   In addition, other activities are permitted on the refuge under Alternative B which are not permitted under Alternative D. A discussion of impacts from these activities is included in the final plan.

8. We disagree. You are correct in stating that impacts from seismic activities are limited and that moose adapt to the presence of humans and development more easily than many species. You are also correct in saying that the plan limits access. However, access to inholdings and lands with valid occupancy rights is guaranteed under Title XI of ANILCA. If oil and gas development occurs on the refuge, surface access will be a necessary part of the development. Such access will, in turn, improve access for subsistence and recreational users of the refuge as well as for other potential economic activities. The Dalton Highway (pipeline haul road) is an example of how access provided for a specific purpose can result in improved access into an area for a large number of other users and uses.

   In addition to oil and gas development, Alternative B also provides for a number of other activities (such as commercial timber harvest, agricultural development, and construction of facilities and access for public use of the refuge), all of which are considered in the impact assessment under Alternative B.

9. We disagree. See the discussion in response 8 above and response 5 to the Alaska Oil and Gas Association.

10. No census data on the population of bears on the refuge has been gathered at this time. Bears are often seen during overflights and aerial survey work. Of eleven waterfowl plots on the refuge, biologists surveying waterfowl populations have had contact with bears on five plots.

Regardless of the number of bears in an area, the statement that bears tend to avoid small clusters of humans is incorrect. For example, during construction of the Trans-Alaska Pipeline, it was a requirement that all construction camps be fenced to keep bears out. Bear/human conflicts were not uncommon during construction of the pipeline and there is no reason to believe that this situation would be different on the Yukon Flats Refuge.

Again, the potential increase in bear/human conflicts discussed under Alternative B is not based only on oil and gas activities on the refuge. With improved access and more public facilities permitted under this alternative, public use of the refuge would probably increase, thus increasing the potential for bear/human conflicts. Public use may increase under Alternative D as well, but public facilities and improved access are less likely to be provided under this alternative.

11. We disagree. As discussed above, oil and gas development cannot occur without direct loss of habitat and increased human disturbance, as well as indirectly improving access for other uses including better access for trappers. These impacts would potentially affect furbearer habitats and populations as much as they would affect other species. Again, the impacts discussed are attributable to other activities permitted in Alternative B as well as oil and gas activities.

12. We disagree. As noted in the Environmental Consequences chapter, increased aircraft traffic associated with oil development and other economic activities is the primary concern related to disturbance of nesting peregrine falcon. Special stipulations to protect nest sites will be applied, as appropriate. However, such stipulations are not always effective in achieving the desired objectives nor are these stipulations always adhered to. Again, it must be noted that oil and gas activities are not the only activities permitted in Alternative B which could adversely affect peregrine falcon.

    Additional information on peregrine falcons has been included in the final plan which indicates that their habitat is more widespread than was indicated in the discussion in the draft plan which was based on a limited number of studies which concentrated mainly on the Yukon and Porcupine rivers. Peregrine falcon sitings have occurred in other areas of the refuge, including in the White Mountains, although active nest sites have not been identified. Based on surveys of small rivers and isolated rock outcrops in other areas of the state, the number of nesting pairs of peregrine falcon on the refuge is likely to range from 20 to 30 pairs.

13. We do not believe the draft plan implies that the impacts from fire and seismic activities are equivalent. As you correctly state, fire has played a major role in creating the vegetation patterns found on the refuge. You are also correct in assuming that this acreage is suitable for wilderness designation. Past seismic activities have required clearing of vegetation along "seismic lines" (clearcutting of a swath 10 to 15 feet wide along a straight survey line which may run for several miles). Visual impacts resulting from these lines are very evident and are a consideration in the management of natural areas and wilderness. Similar impacts do no result from wildfire, particularly if the fire is allowed to burn naturally.

    We recognize that state-of-the-art methods for seismic surveying are reducing the potential impacts resulting from seismic activities. If these techniques are used on the Yukon Flats Refuge then the impacts discussed in the draft plan may not occur. The discussion of impacts from seismic activities in the final plan reflects the possible use of new technologies as well as the techniques already analyzed.

14. We disagree. As noted in responses 4, 6, 7, and 8 to the Alaska Oil and Gas Association, water quality and quantity continue to be affected, even with stipulations and mitigation required by regulations. It is also important to recognize that much of the area where oil and gas activities and other development would be permitted in this alternative are wetland habitats, areas where water level and water quality are particularly critical to the ecosystem. As noted previously, oil and gas exploration and development are not the only activities allowed in Alternative B that would contribute to these impacts.

    The potentially "significant impacts to the fisheries resources" refers to the overall impacts to water resources of implementing Alternative B, not to the impacts of oil and gas activities permitted under this alternative. The "major localized short-term impacts on water quality and quantity" refers to impacts from a variety of activities including, but not limited to, water withdrawals related to oil and gas activities. You must also recognize, as has been pointed out in responses above, that even with stipulations and mitigation placed on oil and gas or other activities which may occur on the refuge, not all the potential impacts can be eliminated.

15. We agree that conducting seismic activities during the winter reduces the extent of potential impacts. This fact is recognized in the discussion of impacts in the plan. Depending on the methods involved, seismic activities, even when conducted during the winter, could have impacts on stream banks, vegetation, and soil surfaces with resulting effects on erosion, turbidity, and other natural processes.

16. The figures presented in Table F-4 (F-3 in the final plan) do not reflect salmon populations, only the number of salmon caught be commercial fishermen during a given year. There are a number of factors, only one of which is the population of salmon, that can explain why commercial catches were down over the previous year (or why chum salmon catches where significantly higher in 1981 than in other years depicted in the table). A complex combination of reasons, including market factors, downstream fishing activities, state harvest levels and length of season, salmon populations, and age of spawning fish, is probably the cause for this type of fluctuation in harvest levels.

    We agree that population cycles occur naturally. However, we do not agree that there is no cause for concern relative to impacts from proposed projects causing population cycles to swing beyond their normal range. The impacts of such fluctuations could have significant effects on population characteristics and habitat of effected species over the long term.

17. We disagree. The draft plan does not attribute increased population to increased access resulting from seismic activities. Any improvement in access resulting from seismic activities would be of primary benefit to the local residents, mainly for pursuit of subsistence activities.

The discussion in the draft plan indicates that the primary impact of seismic activities is one of increasing the transient population on the refuge (i.e., impact is a temporary increase). "Significant" is an appropriate adjective to use. Although the typical seismic crew is only 30 to 60 people (less than five percent of the area population), a crew of this size would have a significant impact if brought into any of the communities in the region.

18. This alternative encourages public use of the refuge. The desire for roads connecting villages or with areas outside the refuge would be more pronounced as public use increases on the refuge. Construction of public facilities, such as campgrounds and visitor centers, would be permitted under this alternative, if a demand for these facilities exists. Other economic activities permitted under this alternative, not just oil and gas development, could also lead to improved access on and to the refuge.

19. We agree. Economic growth may accompany oil and gas development. A discussion of the effects of implementing each of the alternatives on the economy, including local, state, and federal impacts, was included in the draft plan. The economic benefits of oil and gas development were included in this discussion. We see no reason to expand this discussion in the final plan.

20. We agree. Alternative B encourages public use of the refuge. Recreational use was recognized as a factor contributing to the growth in public use projected under Alternative B as were oil and gas and other economic activities.

21. We disagree. The discussion of impacts to cultural resources is accurate. See response 11 to Alaska Oil and Gas Association.

22. It is true that sites used for various activities, such as oil and gas development, commercial timber harvest, and sand and gravel extraction, can be reclaimed when use of the site is completed. However, reclamation of disturbed areas, particularly revegetation of sites, is not as easily accomplished in Alaska as in the lower 48. Harsher conditions found in Alaska require more effort and a longer time for rehabilitation to occur successfully. It is also true that many developments which could occur if Alternative B is implemented, such as campgrounds and other visitor facilities, roads, and utility lines, would probably not be abandoned.

The number in Table 19 has been corrected.

23. We disagree. The Fish and Wildlife Service does not have the authority to regulate how private landowners develop their property within or adjacent to the Yukon Flats Refuge except to ensure that such development does not having a significant adverse impact on the resources of the refuge.

Douglas J. Fruge
P.O. Box 83788
Fairbanks, AK 99708

February 7, 1986

Mr. Robert Gilmore, Regional Director
U.S. Fish and Wildlife Service
1011 E. Tudor Rd.
Anchorage, AK 99503

Dear Mr. Gilmore:

I would like to offer the following comments on the draft comprehensive conservation plan (CCP) for the Yukon Flats National Wildlife Refuge (NWR):

1) Regarding oil and gas leasing on refuges, Section 1008 of the Alaska National Interest Lands Conservation Act (ANILCA) directs the Secretary of the Interior to establish an oil and gas leasing program on federal lands in Alaska including most non-wilderness refuge lands. However, in the case of refuges there is the further qualification that this leasing program is to occur only where it would be compatible with the purposes for which the refuge was established. As a prelude to leasing, this section at (b)(1)(A) directs the Secretary to identify areas favorable for the discovery of oil and gas and to conduct studies or analyze data collected by permittees concerning the oil and gas potential <u>and</u> the wildlife and environmental values that would be affected by oil and gas exploration and development in these areas. In addition the Secretary is directed in (b)(2) to consult with the Secretary of Energy concerning the national interest in exploring for and developing oil and gas from these lands. I have the following observations regarding the above:

a) To my knowledge the U.S. Fish and Wildlife Service (FWS) has not developed criteria or procedures for determining compatibility with refuge purposes.

b) Section 1008 directs the Secretary to identify areas that should be studied for oil and gas potential. It also states that if such a study is initiated, then a concurrent study of the fish, wildlife and environmental values that may be affected by exploration and production of oil and gas on these lands must also be conducted. The CCP's do not identify these areas, nor have the planning schedule and process allowed time and effort to make these identifications.

c) The FWS has not satisfied the requirement to consult with the Secretary of Energy concerning the national interest in exploring for oil and gas on these lands.

In light of the above it seems that in order to assure adequate protection of de facto wilderness refuge lands and to satisfy the requirements of Section 1008, the most prudent and logical course would be to recommend for wilderness designation all of those lands found to be suitable and where such a designation would be proper, considering the refuge purposes. In that way Congress would really have the ultimate responsibility for determining the fate of those lands. In the meantime, the FWS would have an opportunity to make the determinations called for in Section 1008. This could even include limited exploration activities for oil and gas while Congress was deliberating over whether to ratify the wilderness recommendations. To indiscriminately state that all non-wilderness refuge lands will be open to oil and gas exploration pending a compatibility determination is side-stepping the requirements of Section 1008 while at the same time needlessly jeopardizing the integrity of de facto wilderness areas on refuges.

1 2) The draft plan for Yukon Flats NWR incorrectly implies that the national interest determination by the Secretary of Energy could override the refuge compatibility determination. This is incorrect and should be corrected in the plan.

2 3) It is improper and misleading to include maps of the Revised Statute (RS) 2477 routes in the draft plan. These routes have no legal significance until validated by a court ruling, and therefore, there is no valid reason for including them in the plan. The maps should be deleted in the final plan. To identify them as "rights-of-way" implies a validity that is false.

Thank you for considering my views.

Sincerely,

Douglas J. Fruge

Response to Douglas J. Fruge.

1. You are correct. The national interest in producing oil and gas from refuge lands will be considered in making the determination of oil and gas exploration and development compatibility with refuge purposes, but it will not override a determination that such activities are incompatible. The final plan has been corrected to reflect this statement.

2. We recognize your concerns related to the inclusion of a map identifying RS 2477 rights-of-way in the plan. However, the Regional Office has been instructed by the Department of the Interior to include a map in the appendix of each plan depicting the RS 2477 rights-of-way within the boundaries of the given refuge.

YUKON FLATS
COMMENTS

Richard J Gordon
Box 1512
Juneau, Ak 99802
January 23, 1986

As written originally, your preferred alternative looks excellent, and I support it. I also support a Sheenjek Wild River all the way to the Porcupine junction. I take exception to the Interior Dept policy of rejecting new wilderness proposals generally. I suggest that relatively small tracts
1 that have the least possible use conflicts be identified, and recommended for Wilderness on the wetlands and somewhere along the Yukon River, so that SAMPLES of these ecotypes be represented in the national wilderness system.

The new oil policy I think is a disaster. a bizarre contortion of the ANILCA requirement. (I do not object to localized well-justified small tracts being leased where the resource potential is greatest & the conflicts are relatively low).

Based on Gilmore's Dec. 6th letter, it is
2 not ~~[illegible]~~ clear even whether Alt D, or Alt B or C is to be the preferred alternative. I also feel absolutely certain that my input (or yours!!!) won't mean a damn thing anyway! (Some way to run a country!)

OVER

For what it is worth, I think that Yukon Flats are as important a waterbird production and staging area as any on the continent, and therefore that oil exploration should be carried on in the winter season ONLY, and that production should be permanently excluded from all areas of the highest productivity or major staging sites. The alternative maps, judging from the new policy, would even leave open for potential leasing the lowermost part of the Sheenjek & the fringes of the proposed White Mountain wilderness proposal. I think parts of the Black River country, at least wide stream corridors, should be permanently closed. In other words, if such a hideous policy is to be applied, you staffers - at the very minimum - should go back to the drawing boards, identify the most critical stream fringes and other critical habitats, ~~as~~ prepare NEW MAPS for the public and the Secretary identifying them, and then fight like hell to get at least those discrete tracts placed off limits. In other words, fight to get the new policy applied with a scalpel, not a meat axe. THAT EFFORT IS YOUR RESPONSIBILITY!

McKinley Park Station Hotel

February 22, 1986

Mr. Gilmore,

I have just returned from a month-long trip outside the U.S. and have only now had the opportunity to review the revised draft of the Comprehensive Conservation Plan for Yukon Flats National Wildlife Refuge. I realize that the extension on the comment period has already passed, but I hope that you will at least consider my comments.

I would first like to offer my support for Alternative E in the revised draft as I feel that the purposes for which the Refuge was established are best served under that alternative. In addition, I would like to offer these specific comments:

1) Oil and gas exploration should not be allowed in minimal management areas in order to protect the integrity of refuge resources. Oil and gas development should only occur in intensive management areas.

Don Soileau/Denise Hanson
P.O. Box 496
Denali N.P., AK
99755

2) Oil and gas development cannot proceed until a compatibility determination is made. The Energy Secretary is to be consulted on the national interest for oil and gas, but this opinion does not override a compatibility determination.

3) To be consistent with Congressional intent, USFWS must not restrict wilderness recommendations. The USFWS needs to care for recommended areas so their wilderness characteristics are not diminished before Congress has the option to designate them wilderness.

4) Since RS 2477 rights-of-way have yet to be formally granted to the State, the USFWS should not identify them in the draft plan.

In making your recommendations to Congress, I ask you to keep one thing uppermost in your mind - These are not oil and gas refuges. These are refuges for fish and wildlife. Thank you once again for giving me the opportunity to express these thoughts.

Sincerely,

Don Soileau/Denise Hanson

Denise Hanson

Don Soileau

Response to Richard J. Gordon.

1. The areas you recommend for designation as wilderness do not meet the Service's criteria for designation as wilderness. The Service is focusing its wilderness proposals on the need for wilderness boundary adjustments or the addition of selective areas with outstanding resource values that may have been inadvertently overlooked during the original wilderness review and subsequent designations undertaken by Congress.

2. Alternative D is the Service's preferred alternative.

1/6/86

Yukon Flats National Wildlife Refuge
U.S. Fish and Wildlife Service Region 7
1011 East Tudor Road
Anchorage, Alaska 99503

Dear William Knauss,

Alternative "A" seems to be the best of all of the alternatives presented.

Unless there is a real shortage in oil and gas and I mean a ~~Critical~~ Critical one, the nesting birds and the mammals of this area should be allowed their historical use of this area.

I should think that even under this alternative the subsistence and recreational use of native peoples would increase due to population growth.

No egging and spring waterfowl hunting allowed here.

Have any studies been initiated to determine the impact over a several years period?

With the huge reserves set aside for oil further north, I really see no reason to allow ~~the~~ the exploitation of this valuable wildlife area at this time.

Thank you for your consideration.

Sincerely,

Mrs Kathryn (Billie) Hicks
Rte 1 Box 232
Joliet, Mt. 59041

404

Nov 27, 1985

Dear Sir,

As I review the draft plan for the Yukon Flats N.W.R. I am puzzled as to why Alternative D should be the preferred alternative. Obviously, either Alternative A or E more closely reflects the management plans required by state & national directives for the area.

1 Alternative "A" is deficient in the sense that no Wilderness Area will be recommended. I feel that a large percentage should be set aside so that future generations will have the opportunity to decide its future use.

Alternatives "E" seems to lean too far toward wilderness while Alternative "D" doesn't not allow enough.

I would prefer to err on the side of too much rather than too little. Wilderness is the only management decision which is reversible in its impact.

2 I also question the statement "traditional subsistence uses. Is using a snow mobile or 4x4 or airplane considered traditional?

I support the rights of native population for traditional uses of the area around their villages but at the same time feel a conflict as the population increases decades because of modern medicine and the carrying power ~~of~~ of the land can not increase fast enough to meet the future needs.

I support Alternative E.

Thank you for a clear, concise and interesting presentation.

Sincerely, Mrs Kathryn Hicks
Rte #1, Box 232
Joliet, Mt. 59041

Response to Mrs. Leon Hicks.

1. Alternative A is intended to depict the current management of the Yukon Flats Refuge. As no land on the refuge has currently been recommended for wilderness designation, Alternative A is an accurate depiction of current management. Proposed management of the refuge under Alternatives D and E, both of which contain wilderness proposals, is the same as current management.

2. Section 811(b) of ANILCA states that " . . . the Secretary shall permit on the public lands appropriate use for subsistence purposes of snowmobiles, motorboats, and other means of surface transportation traditionally employed for such purposes by local residents, . . ." Although aircraft use is not discussed under Section 811(b), use of airplanes (as well as snowmobiles during periods of adequate snow cover, motorboats, and other methods of nonmotorized surface transportation) for traditional activities and for travel to and from villages and homesites is permitted, subject to reasonable regulation, under Section 1110(a) of ANILCA. Service regulations (50 CFR 36.12 and 36.21) reiterate these sections of ANILCA. In general, 4 x 4's and other off-road vehicles would not be considered a traditional means of surface transportation employed by local rural residents engaged in subsistence uses, although exceptions may occur.

January 29, 1986

Dear Sir,

Regarding the Yukon Flats Refuge and your supplement to your draft, let me say that I vote for wilderness status for the Refuge.

This would keep such hostile activities as oil and gas exploration out. Surely roads and heavy equipment and pollution and human pressures are not compatable with wildlife. Yet you appear to be bowing low to oil and gas interests. For shame! I want them out. After all, the Refuge is there primarily for wildlife.

I beg you therefore to consider wilderness designation for Yukon Flats and request that my vote be counted in the final plan.

Concerned Citizen,

Norman Johnson

NORMAN JOHNSON
315 W. 3rd Street, #5
Long Beach, CA 90802

William J. Journey
General Delivery
Stevens Village, AK
99714

March 30, 1986

U.S. Fish & Wildlife Service
Region 7
1011 East Tudor Road
Anchorage, Alaska 99503

Re: Yukon Flats National
Wildlife Refuge

Dear Sir:

Hopefully, the public comment period has not passed on re: above.

I am very concerned about access to refuge lands by non-native rural residents who are land-locked by village corporations lands.

In Alaska, federal lands surround others. (State & Native lands). Non-native rural residents subsistence livelihood is seriously in jeopardy.

I consider my case an extreme situation: I am married to an Alaskan Native and my family resides in Stevens Village, AK. My wife is a shareholder in both Doyon & Dinyea Corp. However, because I am a non-native w/o shares in either corporation I am denied access to corporation lands which surround the village. I am ~~[illegible]~~ essentially trapped in the village w/o any access to refuge lands which I badly need for my subsistence livelihood.

Recently, Dinyea Corp. initiated a ~~[illegal]~~ legal action for an injunction that I not cross their land. As a result, I and my family are denied any right to enter the refuge.

Be that as it may, I need to know if the Refuge Plan addresses my type of access problems.

Additionally, can you help direct me to an agency that would have on record any easements across Dinyea land into the Refuge. Does Dinyea Corp have ~~[illegible]~~ control over the Yukon River, islands therein, and sloughs?

Any help from your office is greatly appreciated.

Thank you,

William J. Journey
Gen Del
Stevens Village, AK
99774

(3)

James G. King
1700 Branta Road
Juneau, AK 99801

Regional Director, Att. Bill Knauer
US Fish & Wildlife Service
1011 East Tudor Road
Anchorage, Alaska 99503

11/29/85

Dear Sir,

These are comments on the draft Yukon Flats Comprehensive Conservation Plan/Environmental Impact Statement for your consideration.

In general I concur with the provisions of "preferred alternative" D. As one who has had a 30 some year association with wildlife conservation on
1 the Yukon Flats and worked on the original ANILCA EIS I believe there are some additional alternatives that should be considered for the long term management of the refuge.

The Yukon Flats is the most significant refuge in the world for nesting game ducks. The Flats produce nearly 2% of North America's ducks thus is the basis of at least 2% of the huge hunter support industry. Greater attention needs to be given to the potential for raising more ducks on a continent where the needs of a burgeoning human population are often in conflict with the needs of waterfowl. The draft CCP seems to address management of people and their needs rather well; but but does not address wildlife management as we practice it today or as we may practice it in the centuries ahead. The waterfowl habitat, enhancement potential was a factor in the original proposal for a Yukon Flats Refuge.

All alternatives in the draft stress the protection of wildlife in its natural diversity. Indicated in the plan is the fact that present numbers of Dall sheep and moose are far below what the habitat could be expected to support. Trumpeter swans are below historical records. Ducks and king salmon may also be less today than in the past. Therefore an important alternative should be restoration of these populations to optimum levels through adequate management effort.

The art of wildlife management is advancing rapidly through the application of innovative new practices. These advances depend on proper scientific research. Making research a primary public use and supporting it through facilities on the refuge to support students and other independent researchers could stimulate the whole process. Intensive support and encouragement of wildlife research is thus another important management alternative.

Enhancement of habitat for birds is an objective of our treaty with Japan and perhaps others. The National Wildlife Refuge system, many States and private organizations such as Ducks Unlimited have impressive records of enhancing bird habitats elsewhere in America. This is often
1 done through management and redistribution of water. Most of the important furbearers of the Flats are water oriented. Management of water through conventional means appears to be prohibited in all alternatives of the CCP. Many parts of the Flats are extremely dry. Redistribution of water does occur naturally through erosion, through

1 developement of thaw lakes, as a result of ice jams and log jams and through the activity of beaver. With a little help from man these natural processes might be accelerated to produce vast blocks of enhanced habitat. Water management is viable and important alternative.

The private inholdings on the refuge include some of the best wildlife habitat. These areas are not developed and are indistinguishable from refuge lands now. The primary interests of the owners seem to coincide with refuge objectives to protect habitat and produce wildlife. Incorporation of much of the private lands into the refuge would not be at odds with local needs. A major effort could be made to acquire, lease, or develop cooperative agreements with the private sector to protect habitat on the inholdings in return for enhancing wildlife populations. A well directed effort could enhance the life style of the local residents by an extension program to help them utilize refuge resources more effectively. With a little planning and education the local population could learn to capitalize more on the value of the presently lightly utilized fur resources, the wood resources and the small but increasing tourist industry. A program to enhance the local economy in return for inclusion of private lands within the refuge is an alternative that could provide extensive benefits to the refuge as well as the local population.

There does not seem to be any significant difference between Alternative A and Alternative D as presented. The preceding suggestions could be incorporated in Alternative D and present a much more realistic picture of the potential for the future management of the refuge. I believe the people of Alaska and the nation want and will support an innovative and imaginative conservation and management alternative for the Flats and such alternatives must be presented for their consideration. A highly productive refuge will be much safer in the years ahead as the competition for land in America becomes more intense.

Thank you for the opportunity to comment on this draft plan. Please add my name to your mailing list for additional planning documents on the Yukon Flats Refuge.

Sincerely,

Jim King

James G. King
1700 Branta Road
Juneau, Alaska, 99801

408

Response to James G. King.

1. Options for increasing, establishing, or enhancing existing fish and wildlife populations are included in the alternatives analyzed in the draft plan. In the final plan, water stabilization projects (included under the category of habitat manipulation) for the benefit of waterfowl populations are permitted in areas of the refuge in the intensive and moderate management categories on a case-by-case basis subject to provisions of NEPA and a compatibility determination. However, no areas of intensive or moderate management are included in Alternative D, the Service's preferred alternative.

   The Yukon Flats are currently one of the most productive waterfowl nesting areas in North America. Because of this high level of production, the refuge staff sees no reason to alter the current water regime on the refuge by proposing any water stabilization projects simply to enhance current production on the refuge. There is no present evidence that the productivity of the refuge is likely to change significantly over the next several years. However, if a significant decline in waterfowl production does occur which can be directly tied to habitat conditions on the refuge, water stabilization projects could be undertaken as emergency measures to stabilize or increase the waterfowl population. In addition, the plan for the Yukon Flats Refuge will be reviewed periodically and revised if necessary. If conditions warranted, additional provisions for water stabilization projects could be included in the plan at that time.

   The Service recognizes that the private inholdings on the refuge include some of the best waterfowl habitat. Managing this habitat in an undeveloped state is important to maintaining the integrity of the wildlife populations on the refuge. One method of ensuring this integrity would be to enter into cooperative agreements or land bank agreements with the private inholders. A discussion of the Service's intent relative to these agreements is included under the Common Management Direction on Cooperation with Owners of Refuge Inholdings and Adjacent Lands. Such agreements would be pursued under all the management alternatives.

   Other than the wilderness proposal included in Alternative D, there is no difference between Alternatives A and D. For reasons discussed above, we do not see any need to include additional alternatives in the final plan.

January 10, 1986

U.S. Fish and Wildlife Service
1011 East Tudor Road
Anchorage, Alaska 99503

To whom It May Concern,

I would like to submit my comments on the Yukon Flats National wildlife Refuge.

My interests lie in the protection of the wilderness and wildlife values of this unique area.

I am concerned with Fish and Widlife's view of fulfilling Congress's purpose for establishment of this Refuge.

Given the choice of management alternatives offered by the Fish and Wildlife, I would like to state my preference for Alternative E with the added note that NO oil or gas exploration should be allowed in the Refuge.

I do not agree with and I question Fish and Wildlife's new policy on oil and gas exploration and leasing on National Wildlife Refuges in Alaska. I also question the timing of the release of this new policy and the lack of public knowledge of it. I would like to point out the obvious: ~~conta~~ contradiction of allowing oil and gas exploration and not allowing leasing. This of course, makes no sense whatsoever and in areas where leasing will not be allowed, exploration in turn should not be allowed.

This area should be managed to preserve the most important of wilderness values which should ultimately be wildlife habitat and water quality. I see no reason that subsistence hunting and primitive recreation should come in conflict with protection of these values as long as they maintain close to the present levels of use.

I find it unsettling the large amount of wilderness suitable for designation and the small amount actually recommended for designation in the other Alternatives including the Preferred Alternative.

Thank you for this opportunity to comment.

Sincerely,

Judy Larquier

Judy Larquier
PO Box 80285
Fairbanks, AK 99708

409

1-9-86

Dr. Gilmore:

Please protect our precious Yukon Flats National Wildlife Refuge! These refuges are for wildlife not for oil and gas development. Please support alternative 'E' and 1) do not allow gas and oil exploration in minimal management areas, 2) urge a compatability determination, 3) do not restrict wilderness recommendations, and 4) do not identify RS 2477 rights-of-way in the draft plan. Thank you!

Sincerely,
Marianne Mills
3390 Silverleaf Apt. A
North Pole, AK 99705

Philip Moran
Post Office Box 82774
Fairbanks, Alaska 99708

6 February 1986

Mr. Robert Gilmore
Regional Director
US Fish and Wildlife Service
1011 East Tudor Road
Anchorage, Alaska 99503

Dear Mr. Gilmore:

I strongly urge you to designate the entire Yukon Flats Refuge as wilderness. I believe it would be terrible to have oil and gas exploration and development throughout the Refuge.

Many thanks.

Sincerely,

Deborah Niedermeyer
754 Ninth Avenue
Fairbanks, Alaska 99701

Februrary 10, 1986

Dear Mr. Gilmore,

My husband and I have spent a total of several months paddling through the Yukon Flats National Wildlife Refuge. We love it there. Yes, the rivers are sluggish and the landscape, at first glance can seem unspectacular, but this "unspectacular" land supports a spectacular quantity and array of bird and animal life. We never see the number and variety of birds, bears, and small fur-bearers in the high White Mountain country as we do when we hit the flats.

The land itself has a special beauty not found in areas with "unique and special features". Willowy mud banks marked with thousand of goose prints and one dainty stright line of fox prints are thrilling in a way snow capped peaks are not. Grassy ponds surrounded by damp grassy fields which are inturn surrounded by partches of alder, birch. and spruce are magnificent in a way that the Nenana Gorge can't be.

Your report is correct. The entire Yukon Flats Refuge is suitable fo wilderness designation. The notion that only 8% of the refuge contains "unique and special features" worth preserving shows an incredible insensitivity, both environmental and aesthetic to what the refuge reall is. How would human happiness be possible if could not appreciate small and subtle and quiet beauty when we find it?

Please, Mr. Gilmore, go out to the flats and take another look. Try to appreciate the wonderful things that are there. Then come back and re-write your plan to preserve them.

Sincerely,

Deborah Niedermeyer

17 Feb. 86
Dennis Ronsse
Gen. Del.
Kwigillingok, AK.
99622

Robert Gilmore
Region Director
U.S. Fish + Wildlife Service
1011 E. Tudor Rd.
Anchorage

Dear Mr. Gilmore

I understand that the U.S.F.W. is in the process of planning for the Yukon Flats Refuge. I realize there are no simple answers to all the concerns that must be addressed but I want to encourage you to protect the Yukon Flats Refuge from oil and gas exploration. I realize that doing so may run against the current movement in the upper ranks of Dept. of Interior, but when looking to the future it is our best choice when we protect the lands that have been set aside as wildlife Refuges. I feel that it is important to stand firm on this issue when planning the future of the Yukon Flats refuge. Thanks for your concern and may the vision of superman be with you as you attempt to estimate the best use of the Yukon Flats Refuge.

Sincerely,

Dennis Ronsse

P.S. please let me know if the final plan does provide access for oil and gas exploration.

Box 1110
Sitka, Alaska 99835
February 13, 1985

Robert Gilmore
Regional Director
US Fish and Wildlife Service
1011 East Tudor Road
Anchorage, Ak 99503

Dear Sir:

Sorry I am several days late in making a comment on the Yukon Flats National Wildlife Refuge Draft.

Alternative E is my choice. But I want to add my disappointment in the recent supplement where you are pushing oil and gas development throughout the Refuge - certainly a short sighted policy and not consistent with the purpose for which the Refuge was established. This is a wildlife refuge. As such it is fully eligible for wilderness designtion and you should press for this instead of some emasculated minor acreage.

Thanks for reading my comments. I hope that they can be included in the record of testimony from citizens.

Yours truly,
Lee M. Schmidt
Lee M. Schmidt

412

Pam & Chris Scranton
P.O. Box 80
Venetie, Ak. 99781

Jan. 5, 1986

To Whom It May Concern:

We would like to make it known that we support Alternative E for the Yukon Flats Comprehensive Conservation Plan. It is the only plan that allows for complete wilderness designation, along with continuing subsistence use. We do not believe that a national refuge should be used for oil & gas exploration as was recently mandated by the Reagan administration. Development of the resource can only follow. The purpose of a national refuge is to protect, not develop the resource. We don't see where oil & gas exploration fits into the picture. Please consider Alternative E as the best choice to protect the fish & wildlife of the Yukon Flats Wildlife Refuge for future generations.

Sincerely,
Pam & Chris
Scranton

Shell Western E&P Inc.
A Subsidiary of Shell Oil Company

P.O. Box 527
Houston, TX 77001

200 N. Dairy Ashford
Houston, TX 77079

October 8, 1985

United States Department of the Interior
Fish and Wildlife Service-Regional Director
ATTN Mr. Bill Knauer
1101 E. Tudor Road
Anchorage, AK 99503

Gentlemen:

SUBJECT: COMPREHENSIVE CONSERVATION PLAN
YUKON FLATS NATIONAL WILDLIFE REFUGE
STATE OF ALASKA

We are in receipt of the draft Comprehensive Conservation Plan/Environmental Impact Statement and Wilderness Review for the Yukon Flats National Wildlife Refuge, Alaska (CCP/EIS).

The draft CCP/EIS includes five alternative strategies for the long-term management of the Yukon Flats National Wildlife Refuge. We do not wish to see oil and gas activities disallowed on the entire refuge. Hence, we recommend that "Alternative B" be used to guide management of the refuge. Our secondary recommendation would be to use "Alternative C." We believe that these alternatives provide for maximum mixed use of the Yukon Flats National Wildlife Refuge.

Thank you for the opportunity to comment on this matter.

Very truly yours,

K. E. Hughes
District Land Manager
Pacific Frontier Division

KEH:GJ

CRCN8528171

413

United States Department of the Interior

FISH AND WILDLIFE SERVICE
1011 E. TUDOR RD.
ANCHORAGE, ALASKA 99503

IN REPLY REFER TO:
PSS-PL/0318K

OCT - 9 1985

Dear Reader:

Recently you were asked to review and comment on a draft Comprehensive Conservation Plan/Environmental Impact Statement (CCP/EIS) and Wilderness Review for the Yukon Flats National Wildlife Refuge in Alaska.

Since you received a copy of that plan, the Fish and Wildlife Service has made several significant changes in its policy on oil and gas exploration and leasing in Alaskan refuges. Under this new policy:

1. Oil and gas exploration activities may be permitted throughout the Yukon Flats Refuge, subject to a site-specific determination of compatibility with refuge purposes and consistency with the management objectives set forth in the CCP. However, no exploratory activities will be allowed on the Refuge prior to the issuance of a record of decision.

2. In compliance with section 1008(a) of ANILCA, a general determination of the compatibility of oil and gas leasing with refuge purposes and consistency with the management objectives will be included in the final CCP for the Yukon Flats Refuge. If determined to be compatible, a leasing program would not be undertaken prior to consultation with the Secretary of Energy to determine the national interest in developing oil and gas on refuge lands.

In order to evaluate the environmental consequences of oil and gas exploration and leasing activities on the Yukon Flats Refuge, it will be necessary to revise the draft plan. Consequently, the public hearing on the draft plan scheduled for Tuesday October 22, 1985 in Fairbanks has been cancelled and the closing of the comment period will be extended beyond December 6, 1985.

A supplement to the draft plan is currently being prepared and will be mailed to you in the near future. At that time a new hearing date will be announced and the comment period will be appropriately extended.

Sincerely,

Regional Director

Drilling for oil in a National Wildlife Refuge is saccrosant, in the face of a current world oil glut. Reagan stinks. Thoes in charge should raise holy hell.

Van Skipp
141 Emerson Drive
Versailles, Kentucky 40383

MADD

[illegible]

Ken Shrewsbury
SRB 334
Copper Center AK 99573

[illegible]
February 19, 1986

Robert Gilmore
Regional Director
US Fish and Wildlife Service
1011 East Tudor Road
Anchorage, Ak 99503

Dear Mr. Gilmore:

I am writing in response to the draft Comprehensive Conservation Plan for the Yukon Flats National Wildlife Refuge. It is my believe that the wildlife resources of this area are of utmost importance and should take priority over any other interests. Therefore, I oppose the new policy on gas and oil development which allows these activities throughout the refuge. In order to protect the integrity of refuge resources, gas and oil development should not be allowed in minimal management areas but in intensive management areas only.

The position of the USFWS should be for gas and oil development on the refuge where it is compatible with the purposes for which the refuge was created. A compatibility determination needs to be made before gas and oil devlopment occurs, and the Energy Secretary's opinion should not override the outcome of such a report.

The subject of wilderness designation plays a crucial role in the protection of the refuge resources. Section 1317 of the Alaska National Interest Land Conservation Act calls for wilderness review and recommendations of areas such as the Yukon Flats NWR. The USFWS must not restrict wilderness recommendations. The USFWS must also care for recommended areas so their wilderness characteristics are not diminished before Congress has the option to designate them wilderness.

I understand that gas and oil development is an important part of our national economy, however it should not occur in a haphazard manner or preclude the future use of other equally valuable resources. It is my sincere belief that with proper management and ethical motives, the agencies of the US goverment can accomplish their goals.

Regards,

Roselynn Ressa Smith

Note: The Fish and Wildlife Service has transcribed this hand written letter in order to reproduce it in this document.

John R. Swanson
P. O. Box 6554
Minneapolis, Minn. 55406

November 28. 1985
U.S. Fish and Wildlife Service - Region 7
1011 East Tudor Road
Anchorage, Alaska 99503

Dear Sirs:

Please accept my Comments, as follows, concerning ===
Comprehensive Conservation Plan - Environmental Impact Statement - Wilderness Review - Draft - Yukon Flats National Wildlife Refuge.

This area contains outstanding wilderness, wildlife, fish, botanic, scenic and cultural resources of certain national significance. An area that provides a vital and, as all Americans hope, a lasting refuge for Man, and for all Life, on this endangered planet. An area, then, that fully benefits Man, and fully benefits all Life on this damaged Earth.

I wish to advise that I oppose this National Wildlife Refuge Preferred Alternative, as such will decimate surface and sub-surface resources and, thus, will Destroy this Yukon Flats National Wildlife Refuge.

I fully recommend that we Save this unique, this very exceptional, area.

1 And, in this regard, strongly suggest the following:

- o Establish by an Act of Congress the Yukon Flats National Wildlife Refuge Wilderness of some 11,589,375 acres, and include in our National Wilderness Preservation System.
- o Establish by an Act of Congress the Yukon Flats National Park (National Park System - National Park Service) of about 21,463,215 acres with a
- o Wilderness of some 21,249,102 acres and included in our National Wilderness Preservation System.
- o Establish by an Act of Congress the following rivers as units of the National Wild and Scenic Rivers System: Sheenjek, Porcupine, Birch Creek, Black, Christian, Chandalar, Hadweenzic, Hodzana, Dall, and Yukon.

And to select the following permanent planning and management alternative for the National Wildlife Refuge:

Alternative Preservation Wilderness Wildlife Biological Scenic Resources.

1 To permanently ban all forms of surface and sub-surface activities - developments on this and on all units managed by this U.S. Fish and Wildlife Service. Including Oil and Gas activities - developments. With no developments - activities on any current, proposed and potential wilderness units. And, no release of any roadless areas.

To acquire all Inholdings on all Public Lands.

With no disposal of any public lands.

For when we Save our Natural lands and waters; we Save America!

Sincerely,
John R. Swanson (Signature)
o

Response to John R. Swanson.

1. As you have correctly noted in your letter, the proposals you suggest can only be implemented by an Act of Congress. The alternative you suggest for managing the refuge would also require congressional action to implement as many of the activities which you would ban from the refuge are permitted under the Alaska National Interest Lands Conservation Act, the Alaska Native Claims Settlement Act, and other congressional acts governing the management of National Wildlife Refuges.

Feb 3, 86

To: Mr. Bildhauer
Regional Director Fish and Wildlife Service

I am writing to voice my concern over the authorization of oil and gas exploration in the Yukon Flats Refuge. It is time that human [illegible] activity stop usurping and degrading the habitat of our [illegible] on this planet. Why don't we grow up and understand that all living organisms on this earth have an inherent right to exist undisturbed. The balance of relationships is being lost due to [illegible] at an alarming rate. In the long run we undermine our ultimate [illegible] support systems of our children's children's [illegible]. We simply [illegible] to a new manner of thinking in [illegible] sources.

Please sir, I urge you to recommend the entire refuge for [illegible] in the National Wilderness Preservation System.

Thank you for your time.

Sincerely,
Curtis L. Terrall

Mr. & Mrs. Curt Terrall
2338 Engineers Cutoff
Juneau, AK 99801

Texaco Inc

February 12, 1986

YUKON FLATS CCP/EIS/
WILDERNESS REVIEW AND SUPPLEMENT

Bill Knauer
Regional Director
U. S. Fish and Wildlife Service
1011 East Tudor Road
Anchorage, Alaska 99503

Dear Mr. Knauer:

We would like to commend the Fish and Wildlife Service on a comprehensive plan that makes reasonable allowances for multiple use of the Yukon Flats region. We believe that wildlife resources are well protected in each management alternative. We at Texaco are very aware of the great amount of time and effort necessary for generating documents such as this.

As the Draft Supplement takes into account the Service's revised oil and gas exploration policy, our comments are directed to that document.

Although the BLM's assessment of oil and gas resources in the Refuge may be a useful tool in making initial decisions about resource potential, there is no adequate way to truly assess the subsurface potential without seismic surveys and test wells being drilled. We believe that such means must be used to provide the information necessary to perform an accurate national interest determination.

At the outset, we wish to register our strong support for alternative B, as it allows access for exploration to most of the Yukon Flats sedimentary basin which may have oil and gas potential. It also recognizes the fact that current population and activities are centered in adjacent parts of the area. At the same time, the majority of the refuge would be targeted for minimal management. With Alternative B, however, we are concerned with the narrow strip of minimal-management land along the southern edge of the Flats. Not only does this area contain an important segment of the sedimentary basin, but it abuts both Federal multiple-use lands and State lands. As areas of intensive management lie adjacent to this strip, it would appear logical to keep it in moderate or intensive management. This would allow for reasonable support facilities should oil and gas production be established.

1 As stated in the Regional Director's cover letter to the Draft Supplement, the focus of the document is on the impacts of allowing geological/geophysical exploration and of leasing. It appears that the impacts of these operations in the document are consistently overstated. As explained later in these comments, some of the perceived impacts are incorrect because the operations mentioned are no longer in use by the industry. Even more distressing is the lack of recognition in the supplement that there is a comprehensive network of State and Federal regulations which specifically addresses each one of the listed impacts and which mandate either mitigation or prohibition of certain actions. In addition, the history of oil and gas exploration and production in Alaska and the experience gained from regulation of operations in the Cook Inlet region, in offshore waters, and in the Arctic seem to be ignored in the discussion of impacts. Consequently, it appears that any determination of compatibility by the Fish and Wildlife Service of oil and gas operations with the purpose of the Yukon Flats NWR may be unfairly biased by the inaccurate information contained in the Draft Supplement. The following comments on individual sections of Alternative B of the Supplement are intended to offset the overall impression that significant environmental harm may be expected if Alternative B should be selected.

2 It was assumed throughout the document that leasing is the industry action expected to have the most extensive impact on the environment. A lease is simply a legal document that gives the lessee the right to develop an oil and gas deposit if exploration should prove it to be present in commercial quantities. Millions of acres of Alaska have been leased, but less than 1% of that acreage has been developed.

3 In each alternative, it was assumed that seismic exploration will consist of knocking down miles of trees and other vegetation. Almost certainly any seismic activity in Yukon Flats will be done in the winter, possibly using portable equipment, small crews, and air-blast techniques which leave no marks on the terrain the following summer. Also, the possibility of summer seismic operations is put forth on Page 15, third paragraph. It is unlikely that either ADEC or ADFG would allow such a project in wetland terrain, without the careful scrutiny of a specific plan giving the most stringent protection to the environment.

4 A long list of potential harmful impacts to waterfowl appears on Page 15, none of which have proven to be a serious problem in the Prudhoe Bay-Kuparuk Development areas. For instance, water quality is expected to be degraded by gravel extraction from stream beds and by improper disposal of muds and cuttings. Stream gravel extraction is discouraged or prohibited by State agencies, and mud and cuttings disposal is regulated in detail to avoid such impacts.

5 On Page 16, sensitivity and intolerance of caribou to disturbance are noted, but mention is not made that the Central Arctic heard coexists with the enormous Prudhoe Bay and Kuparuk developments, and that the herd is thriving and increasing in size.

6 The impacts of oil and gas activity on fisheries could be potentially significant, we are told on Page 18; but, again, the listed events are either prohibited or must be mitigated by State policy and regulation.

6 For instance, improper solid waste disposal, disposal of produced salt water, and improper disposal of muds and cuttings. None of these are significant problems in other producing areas of Alaska.

7 The last full paragraph on Page 18 postulates hastened snow melt and resulting stream erosion because of dust settling on the snow from road and pad use. On the contrary, the earlier melting of dust-covered snow areas should tend to make the overall spring snow melt more gradual and, therefore, less apt to cause sudden rises in stream levels. The areas of significant dust cover usually do not extend more than about 100 meters from a gravel road or pad.

In the same section on Page 18, moderate impacts on water resources are expected from drainages being altered by ice roads. This seems highly unlikely because there is no drainage in the winter and, during the spring thaw, the ice roads are designed to melt into the drainage system.

8 Again, on Pages 18-19, concern is expressed that water supplies will be depleted by drilling activities with resulting major impacts on fishery resources. This has not been a problem in Alaska. There are many sizeable lakes in the Yukon Flats which could provide ample water, and subsurface aquifers are apparently available at reasonable depths. A disruption of water supplies affecting fish resources would not be permitted by ADFG or USFWS.

9 On Page 21, a summary statement says that Alternative B could result in major long-term effects on refuge water quality and quantity in localized areas of the refuge. We believe this is extremely unlikely, given the nature of exploration and production, and the intimate involvement in any plan by the Corps of Engineers, the Environmental Protection Agency, the U.S. Fish & Wildlife Service, the Alaska Department of Environmental Conservation, and the Alaska Department of Fish and Game, none of which are mentioned in the Supplement.

10 Under "Social Conditions" on Page 25, Alternative B is seen as resulting in "a large number" of seasonal and short-term non-local workers. This could be true if several years of exploratory work should result in a localized development operation; but the exploration phase would intermittently bring in quite small and scattered numbers of non-local workers, and camps at drillsites would be almost completely self-contained.

11 On Page 28 under "Cultural Resources," oil and gas activities under Alternative B are seen as potentially damaging to cultural resources and sites. We find it difficult to believe this, as the paragraph goes on to express the USF&WS intent to avoid or minimize such impacts. Moreover, both State and Federal oil and gas leases would certainly carry stipulations to protect cultural resources or sites anywhere in the State.

We can agree with the last sentence on Page 34, which allows that properly-conducted activities, in accordance with regulations and stipulations, should result in no significant sacrifices of long-term productivity on the refuge. In closing, we would again urge that consideration be given to management Alternative B, which we believe

provides for the best and most balanced use of the Yukon Flats region while still preserving the majority of the refuge in a minimal-management status.

We thank you for the opportunity to present our views and comments on the Yukon Flats Draft CCP-EIS-WR and Supplement documents. We hope we can be of some assistance as the plans for Yukon Flats are completed.

Very truly yours,

D. C. Hartman
Advanced Exploration
Land Representative

D2/119

Response to Texaco, Inc.

1. Your concerns have been noted. See response 1 to the Alaska Oil and Gas Association.

2. We agree. See response 2 to the Alaska Oil and Gas Association.

3. Your point is noted. See response 3 to the Alaska Oil and Gas Association.

4. We disagree. See response 4 to the Alaska Oil and Gas Association.

5. Your statements are true to a point. See response 5 to the Alaska Oil and Gas Association.

6. We disagree. See response 6 to the Alaska Oil and Gas Association.

7. We disagree. See response 7 to the Alaska Oil and Gas Association.

8. We disagree. See response 8 to the Alaska Oil and Gas Association.

9. We disagree. See response 9 to the Alaska Oil and Gas Association.

10. Your concerns are noted. See response 10 to the Alaska Oil and Gas Association.

11. See response 11 to the Alaska Oil and Gas Aasociation.

December 2, 1985

Regional Director ATTN: Bill Knauer

Fish and Wildlife Service
1011 E Tudor Rd.
Anchorage, AK 99503

Dear Sir:

Alternative D sounds good as long as we remember the dictionary definition of refuge. Here it means a place of safety for wildlife. Any exploitation of such an area should not damage the wildlife(including the flora). It is not meant to enrich people. We may have to allow some hunting and fishing but trapping should definitely be banned as current traps are inhumane(as testified to be veterineans.

Yourstruly, Ethel W. Thorniley

Ms. Ethel W Thorniley, Mr & Mrs. C Butcher, Mr. & Mrs. R Poland, Mrs. L Coleman, Mr. & Mrs. L Harwood, Mr. & Mrs. A Mansella, Mr. & Mrs. C Morency, Mr. & Mrs. [illegible] Colette, Mr. & Mrs. D Doerr, Mr. & Mrs. J Laberge, Ms. M Stasinski, Mrs/ [illegible] Richardson, Mrs. C Karginski.

Note: The Fish and Wildlife Service has transcribed this hand written letter in order to reproduce it in this document.

Jan. 21, 1986
United States Wildlife Service
1011 E. Tudor Rd. Attn: Acting Director
Anchorage, AK 99503

Dear Sir:

Alternative E seems the best and would seem to protect the wildlife and the flora better than the others. It would best fulfill the definition of "refuge." Trapping with steel traps is barbarous and utterly inappropriate here.

Too many roads - too many people and large boats are also damaging. Airplanes and their landing fields should be carefully regulated as should gas, oil, and other (mining) exploration.

It would be good to have native people as guides and in other important posts as it would give them an incentive to protect the refuge, its wildlife and flora.

Yours truly,
Ethel W. Thorniley (signature)

Please excuse the writing. I am having trouble.

In response to the draft plan for the Yukon Flats refuge, I find it inadequate. Recommendation of only 8% of the refuge as wilderness is absurd. I recommend and support wilderness designation for the entire refuge. Also, oil and gas exploration should not take place prior to collection of comprehensive biological data, the analysis of the cumulative impacts to the refuge and completion of the compatibility and national interest tests.

Sincerely,

Judi Thurmond
Star Rte. Box 334
Copper Center, Alaska
99573

420

Unocal Oil & Gas Division
Unocal Corporation
P.O. Box 190247
Anchorage, Alaska 99519-0247
Telephone (907) 276-7600

UNOCAL 76

February 4, 1986

Robert T. Anderson
District Land Manager
Alaska District

Regional Director
Fish and Wildlife Service
1011 E. Tudor Rd.
Anchorage, Alaska 99503

Attention: Mr. Bill Knauer

NORTH SLOPE AREA
State of Alaska
Yukon Flats National Wildlife Refuge
CCP/EIS Comments

Gentlemen:

Union Oil Company of California has completed its review of the draft Comprehensive Conservation Plan/Environmental Impact Statement and Supplement for same and offers the following comments with regard thereto. We are in favor of and support alternatives which allow Industry access and opportunity to evaluate the hydrocarbon potential of a given area. Such analysis is an integral part of identifying and assessing the Nation's assets. In view of the proposed alternatives, Union Oil Company believes that alternative "B" most closely reflects the intent of the Fish and Wildlife Service's recently restated policy of Oil and Gas Exploration on Refuge Lands. We feel that adequate flexibility, as it relates to oil and gas exploration, needs to be maintained in the CCP/EIS. This will insure and facilitate balanced multiple use and allow for adequate oil and gas potential information to be collected so that a responsible national interest and compatibility determination may be made.

Very truly yours,

Robert T. Anderson / KAT

Robert T. Anderson

KAT/sk

Feb 10 1986
1048 Norris Ln
Fairbanks, AK 99712

Robert Gilmore, Regional Director
USFWS- Anchorage, AK

Dear Sir:

Are we so poor, so destitute, so hopeless, so viscerless
That we cannot understand all the world does
Not run on oil! Some creatures, including myself,
need to know wilderness in their bones and refuges
in mountains, or, a leaf. No oil operations, ever!

I support alternative E & I know thousands of
others who also do.

Thank you

Jane N. Williams

Response to Comments from the Fairbanks Public Hearing held January 7, 1986 at the Noel Wein Library, 1215 Cowles Street, Fairbanks, Alaska.

Mr. Dave Lacey: My name is Dave Lacey, I'm with Dinyee, and making a few comments here on the plan. I guess first off, on your map here, at one point you had the RS 2477's indicated, and we oppose those to be placed on your -- your -- whatever you call it, your status plat maps or the final refuge maps. We think that that's unnecessary. Some of those, particularly the Hickel Highway, were illegal in the first place, and now to add to the confusion and perpetrate their existence would be to con- -- you know, further perpetrate this wrong. So we oppose any RS 2477 marking on the maps of any kind and would ask that you remove them from those maps.

Response: We recognizes your concerns relative to the identification of RS 2477 rights-of-way on a map in the CCP. However, the Regional Office has been instructed by the Department of the Interior to include a map in the appendix of each CCP depicting the RS 2477 rights-of-way within the boundaries of the given refuge.

Mr. Dave Lacey: There's some various other places where we have some questions, like there's some errors here in the report also. Like at one point they list the population of Stevens Village and say that it's 64 percent Native with the rest being non-native, and that's an obvious error there.

Response: We agree that the 64% figure for the Native population of Stevens Village is probably incorrect. A footnote has been added to Table 11 which recognizes your concern. However, the percentage was derived from figures in the 1980 census. They came from: Table 55. General Characteristics for the Total and American Indian, Eskimo, and Aleut Persons on Reservations and Alaska Native Villages: 1980. From:

U.S. Department of Commerce, Bureau of the Census. 1982. 1980 Census of Population, Vol. 1. Characteristics of the Population. Chapter B - General Population Characteristics. Part 3 - Alaska. PC 80-1-B3.

Response to Comment from the Anchorage Public Hearing held January 9,1986 at the Pioneer School House, 3rd and Eagle, Anchorage, Alaska.

Ms. Suzanne DePaul: We appreciate the time and effort involved in evaluating refuge values to the extent necessary to create a workable conservation plan. However, we believe that two aspects of the process proposed for adopting this plan are either in conflict with the Service's oil and gas policy or the provisions of Section 1008 of ANILCA.

First, the Service's policy has made clear that the compatibility of oil and gas leasing will not be determined until information on the hydrocarbon resource potential of the refuge is obtained, and the Secretary has considered the national interest in producing oil and gas from such lands.

However, the cover letter to the draft plan states that an initial compatibility determination will be made without this information, or consideration of the national interest.

An initial determination of incompatibility would clearly be improper and inconsistent with the provisions of ANILCA.

Response: The Service has not included an initial incompatibility determination in the final plan. Oil and gas leasing and development would not be allowed on the refuge at this time under the Service's preferred alternative, Alternative D. Therefore, an incompatibility determination is not required at this time. Should future revisions of the plan identify areas of the refuge for inclusion in the intensive or moderate management categories - where oil and gas leasing and development could be allowed, an incompatibility determination would then be made using all data available to the Service at that time.

Ms. Suzanne DePaul: Second, the cover letter states that leasing of areas proposed for minimal management in all alternatives of the plan will automatically be considered incompatible. We strongly believe that such an automatic determination now, without information on hydrocarbon potential, or secretarial consideration of the national interest, would violate Section 1008 of ANILCA.

Response: The current oil and gas exploration and leasing policy for national wildlife refuges in Alaska states that "(t)he Service will automatically consider oil and gas leasing to be incompatible with the purposes for which the refuge was established on those portions of the refuge that were designated as minimal management areas in all alternatives of the CCP." Until this policy is changed, the Service will continue to implement it as it is written.

Ms. Suzanne DePaul: Third, we would also suggest that transmission lines and pipelines be listed as permitted uses in the minimal management classification areas which surround moderate and intensive management areas. If development should occur in either Native inholdings, or in moderate and intensive management areas, such facilities will be necessary to permit full use of these lands and to transport any products off of the refuge.

Response: If necessary to assure adequate and feasible access for economic and other purposes (Section 1110(b) of ANILCA) or to secure to the owner the reasonable use and enjoyment of nonfederally owned lands (Section 1323(b)) with valid existing rights, rights-of-way for transmission lines or pipelines may be granted subject to reasonable regulations following procedures under Title XI of ANILCA. Such rights-of-way grants are subject to a determination that such system would be compatible with the purposes for which the unit was established and there is no economically feasible and prudent alternative route for the system. Such rights-of-way could be granted regardless of the management category through which the right-of-way is located because of valid existing rights.

Mr. Jack Hession: Second reaction is, you need an alternative. In the -- in the plan that closes the public lands to oil and gas exploration while congress reviews the wilderness proposal, whatever those may be. There's going to be competing ones, but from a legal standpoint we believe that such an alternative is appropriate.

Finally, I'll explain that. In the Alaska Lands Act Fish and Wildlife Service is given the option to either manage the -- the refuge lands for wilderness and close them to all uses, or not as it so chooses. And in none of these alternatives is the option presented to the public. That is a tightly status quo no, no oil and gas exploration, no nothing until congress at least reviews the -- the lands that are suitable for wilderness. That's a major defect of this plan.

Response: Under the current oil and gas exploration and leasing policy for National Wildlife Refuges in Alaska, geological and geophysical exploration (including seismic) may be allowed (except in designated wilderness) where site-specific stipulations can be designed to ensure compatibility with refuge purposes and consistency with management objectives set forth in the plan. Until such time as this policy is changed, we have not consider the alternatives you suggest as they are not in compliance with the current policy.