

5. Implementation and Monitoring

Implementation of the Koyukuk, Northern Unit Innoko, and Nowitna National Wildlife Refuge Comprehensive Conservation Plan (Plan) will be accomplished, in part, through various step-down plans (section 5.1). Each step-down plan has its own program focus, identifying and directing the implementation of strategies designed to achieve objectives outlined in the Plan (chapter 2, section 2.1). Implementation also includes identifying partnership opportunities that assist in accomplishing refuge objectives. See section 5.2.

Monitoring the progress of Plan implementation is accomplished by a variety of methods (section 5.3). Evaluation of monitoring results may lead to amendment or revision of the Plan (section 5.4).

5.1 Step-Down Plans

Step-down management plans are plans that deal with specific management topics, such as the inventorying and monitoring of wildlife populations or the management of fire on the Refuge. They describe specific, topic-related management strategies and implementation schedules and provide details necessary to implement the goals and objectives in this revised Plan. Step-down plans identified for the Refuge include the following:

- Wildlife Survey and Inventory Plan, June 2008
- Fisheries Management Plan Nowitna National Wildlife Refuge, 1991
- Fisheries Management Plan Koyukuk National Wildlife Refuge, 1993
- Cultural Resource Guide, 1996
- Koyukuk and Northern Innoko National Wildlife Refuge Fire Management Plan, November 2005, to be updated in 2010
- Nowitna National Wildlife Refuge Fire Management Plan, December 2004, to be combined with the Koyukuk Fire Management Plan and updated in 2010
- Koyukuk and Nowitna National Wildlife Refuges Media and Community Relations Guide, August 2006
- Koyukuk/Nowitna Station Safety Plan, February 2004
- Occupant Emergency Plan, 2005
- Spill Prevention Control and Countermeasure Plan, 2005
- Plan of Study: Water Resources Investigation—Koyukuk National Wildlife Refuge, June 1998
- Plan of Study: Hydrologic Resources Investigation Nowitna National Wildlife Refuge, June 1998
- Wilderness Stewardship Plan, to be prepared within two years of approval of a U.S. Fish and Wildlife Service wilderness policy
- Land Protection Plan

5.1.1 Wildlife Survey and Inventory Plan

Wildlife and habitat inventory and monitoring plans have been required by the U.S. Fish and Wildlife Service policy for a number of years. Refuge staff prepared the initial habitat inventory and monitoring plan in the 1991. This plan was updated in June 2008. Recently, the Alaska Region of U.S. Fish and Wildlife Service implemented a new policy mandating development of

inventory and monitoring plans (I&M Plans) for each refuge. The policy requires the Refuge to review the I&M Plan every two years. Regional Office review is required every five to eight years. Updates to the I&M Plan will be made as indicated from these reviews. The Refuge biological program is scheduled to be reviewed January 2010.

5.1.2 Fisheries Management Plans

The 1991 Nowitna and 1993 Koyukuk fishery management plans provide a description of habitats and fish species known or expected to occur within the Refuge. The plans identify the purposes of the Refuge (as defined in ANILCA) as goals, provide objectives for each goal, and list tasks designed to meet each objective. Some of the tasks list Alaska Department of Fish and Game as the responsible office and may not fall under the jurisdiction of the Refuge, although responsibilities may have changed since the fishery management plans were developed.

Many of the objectives listed in the two fishery management plans have not been addressed or have been only partially addressed, primarily due to lack of staffing and funding. Some progress has been made in implementing the objectives concerning monitoring harvest of fish within the Refuge. Special use permits for commercial recreational guided operations include reporting requirements for fish harvest rates. The Refuge also continues to coordinate law enforcement efforts with the State throughout the salmon season. Monitoring and evaluating subsistence harvest of fish is an ongoing project with the Service Subsistence Office and the Alaska Department of Fish and Game Commercial Fish Division, which focuses on the subsistence harvest of salmon. Information is collected based on personal interviews by the Koyukuk Refuge information technician and permit returns to Alaska Department of Fish and Game.

The two fishery management plans were to be updated every five years. The Nowitna plan is 17 years out of date, and the Koyukuk plan is 15 years out of date. There are no immediate plans to revise either plan.

5.1.3 Cultural Resource Guide

The cultural resource guide assists the refuge staff in meeting legal requirements to protect and manage the cultural resources of the Refuge. The guide specifies how the cultural resource guidance provided by law and regulation, the Service Manual, and the Cultural Resource Management Handbook is to be applied to the Refuge. It outlines roles and responsibilities, summarizes legislation governing management of cultural resources, and contains information of potential use to management. It describes the current state of knowledge of the prehistory and history of the region. It includes a list of projects that would fill in knowledge gaps or complete existing work. This guide was completed in 1996 and will be updated at some point.

5.1.4 Fire Management Plans

The fire management plans describe how the Refuge responds to wildland fire and includes appropriate management responses for fire management activities (suppression, prescribed fire, and wildland fire use). The fire management plan lists specific management objectives regarding the use of fire. Areas of the Refuge are assigned fire management options based on resource protection needs. The Refuge has been divided into fire management options that are based on resource protection needs. The fire management plan identifies Refuge and Alaska Fire Service responsibilities, as well as interagency fire management coordination. Post-fire monitoring and evaluation is part of the plan. The Refuge has a full time fire management officer who oversees the

implementation of the fire management plans. The plans are reviewed annually for needed updates and are scheduled to be combined and revised in 2010.

5.1.5 Media and Community Relations Guide

This plan provides guidance and refuge information for use by the public information officer should a Type I or II fire occur on the Refuge.

5.1.6 Station Safety Plan and Occupant Emergency Plans

These plans focus on providing a safe and healthy environment for employees and visitors. They aim to minimize the potential for injury to employees and the public and to prevent property damage. The safety plan describes programs needed to train personnel how to deal with the environment factors, work materials, and machines that may pose hazards. Its goal is to make safety and environmental health an integral part of every task. These plans contain contact persons and phone numbers to be used in the event of an emergency and are posted at an accessible location in the Galena office. Both plans are periodically reviewed and revised as needed.

5.1.7 Spill Prevention Control and Countermeasure Plan

This plan outlines the procedures, methods, and equipment used at the Refuge to comply with Environmental Protection Agency oil spill prevention, control, and countermeasure standards; and inspection, reporting, training, and recordkeeping requirements. The original plan was implemented in 2005.

5.1.8 Plan of Study: Water/Hydrologic Resources Investigation

These plans were completed in June of 1991 and 1993 for the Nowitna and Koyukuk refuges, respectively. They guide an inventory and assessment of the water resources of the Refuge. Results of the study will be used to quantify in-stream flow water rights for the maintenance and protection of fish and wildlife habitat. Implementation will be determined by budget and personnel availability.

5.1.9 Wilderness Stewardship Plan

A Wilderness Stewardship Plan will be prepared for the Koyukuk Wilderness within two years of the Service adopting a national wilderness policy. This plan will provide additional detailed guidance for management of the Koyukuk Wilderness.

5.1.10 Land Protection Plan

The Refuge Land Protection Plan focuses on private lands within the Refuge boundaries with the goal of identifying and conserving high-quality habitat on those lands. It provides a framework for refuge and private landowner cooperation. Land conservation measures will be pursued only with landowners who are willing to work with the Service and do not obligate the Refuge or landowners to undertake any of the measures identified. The Refuge must consider management goals, priorities, and availability of funds when approached by private landowners with land conservation proposals. This plan is scheduled to be completed in 2012. It will be revised thereafter if changing land status warrants revision.

5.2 Partnership Opportunities

Partnerships with other organizations are among the ways the Service fulfills the mission statement of “working with others to conserve, protect and enhance fish, wildlife, and plants and

their habitats for the continuing benefit of the American people.” Partnership opportunities are consistent in both alternatives.

The Refuge contains several different and dynamic ecosystems, each of which plays an integral part of the huge and healthy functioning landscape known as Alaska. Many of the resources within the Refuge are of regional, State, national, and international importance. The Service recognizes that the public, organizations, and other governmental agencies have interests in the Refuge.

Implementation of many refuge programs requires involvement from these interested parties. The refuge staff looks for opportunities to coordinate activities with the following (among others):

- State of Alaska
- Other federal agencies
- Federal Subsistence Western Interior Regional Advisory Council
- Migratory Bird Co-management Council
- Tribal governments in Galena, Hughes, Huslia, Kaltag, Koyukuk, Ruby, and Tanana
- Gana’A-Yoo (Galena, Koyukuk, Nulato, and Kaltag); K’oyit’ots’ina, Limited (Hughes and Huslia); Dineega (Ruby); and Tozitna, Limited (Tanana) village corporations
- Tanana Chiefs Conference, Inc. (regional Native non-profit organization)
- Local governments in Galena, Hughes, Huslia, Kaltag, Koyukuk, Ruby, and Tanana
- Yukon Koyukuk and City of Galena school districts
- University of Alaska Fairbanks (UAF), University of Alaska Anchorage (UAA), and the University of Alaska Fairbanks museum
- Nongovernmental organizations (including Friends of Alaska National Wildlife Refuges, Alaska Geographic, and Ducks Unlimited)

Refuge biologists routinely cooperate with biologists from the Alaska Department of Fish and Game and the Bureau of Land Management (BLM) to assess status and trends of moose on and near the Refuge. The Refuge has cooperated with the U.S. Geological Survey, Biological Resources Division, on two regional projects (swan marking and banding, and moose calf performance on winter range) and the Natural Resources Conservation Service (monthly snow depth surveys). A revised land cover map and report was developed for the Refuge and surrounding areas in 2002 in cooperation with BLM and Ducks Unlimited. The Refuge annually cooperates with the Boreal Partners in Flight.

Interagency cooperation is crucial when undertaking fire management activities. The BLM Alaska Fire Service (AFS) provides suppression services for all of the Department of Interior agencies in Alaska. AFS is in charge of detecting, monitoring, and suppressing fires on all federal and Native-owned lands.

The Refuge has been awarded Service Challenge Cost-Share Grants, which focused on activities on and near the Refuge and in Galena. Projects have included Galena Science Camps, co-funding the UAF Interior-Aleutians Yukon-Koyukuk Center at Galena, a solar energy demonstration project housed at the Yukon-Koyukuk Center, a swan nesting ecological study, Nogahabara Sand Dunes cultural artifact and beetle surveys, oral history interviews with local trappers, and village invasive species workshops.

Wildlife research is not expected to increase considerably on the Refuge. Public and private partners will be routinely sought where mutual research interests exist and study objectives are similar.

5.3 Monitoring and Evaluation

Monitoring helps the refuge staff track the progress of Plan implementation. Results of monitoring activities show how objectives are being achieved and progress is being made towards accomplishing goals. The Refuge's I&M Plan addresses achieving many of the refuge objectives. It may involve the collection of baseline data which could lead to additional monitoring efforts (see chapter 2, section 2.1). Most of the step-down plans provide detailed methods for inventorying and monitoring activities. Table 5.1 displays possible monitoring indicators and actions to be measured and possible management actions in response to indicators for fish and wildlife, their habitats, plants, recreational uses, and contaminants. Activities will be refined as step-down plans are updated.

5.4 Plan Amendment and Revision

Periodic review and change of this revised Comprehensive Conservation Plan and its various step-down plans will be necessary. As knowledge of refuge resources, users, and uses improves, changes in management may be identified. Fish and wildlife population, user groups, adjacent land users, and other management considerations change with time, often in unforeseen ways. Challenges also may be encountered in trying to implement the Plan.

Revisions are a necessary part of the adaptive management approach used by the Service. This means that objectives and strategies to reach goals can be adjusted. Most of the resulting changes will fine-tune the Plan. These changes will not require modification of this document because minor changes will be addressed in the more detailed refuge step-down and annual work plans. Once the biological program review has been conducted and the Inventory and Monitoring Plan is approved, there may be a change in the direction of the biological program for the Refuge. Only if a major change is required in management of the Refuge would it be necessary to create a new revised Comprehensive Conservation Plan with a new environmental assessment.

To enable refuge users; adjacent landowners; local, State and federal agencies; and other interested parties to express their views on how the Refuge is being managed, the Refuge will periodically hold meetings or use other techniques, such as comment cards and surveys, to solicit comments for evaluation purposes. By encouraging continuing public input, the Refuge will be better able to serve the public, to determine potential problems before they occur, and to take immediate action to resolve existing problems.

Periodically, refuge staff will review public comments, local and State government recommendations, staff recommendations, research studies, and other information to determine if revisions to the Plan are necessary. If major changes are proposed, public meetings will be held, and a new environmental assessment or an environmental impact statement may be necessary. Full review and updating of this Plan will occur approximately 15 years after its approval.

Table 5-1: Inventory or monitoring question examples and possible management actions.

Inventory or Monitoring Question	Measured Characteristics	Goal(s) of Inventory or Monitoring Activity	Possible Management Actions	Possible Sampling Procedure
What wildlife and plant species occur on the Refuge?	Species, location, and density of birds	Collect baseline information	NA: baseline data.	Birds surveyed using point count method with distance estimation
	Species, location, and density of small mammals	Collect baseline information	NA: baseline data.	Small mammals collected using live traps
	Species and location of terrestrial insects	Collect baseline information	NA: baseline data.	Insects collected using various trap and net methods
	Species, location, and density of herbaceous and woody plants	Collect baseline information	NA: baseline data.	Plants collected using various directed and random search methods
	Habitat information associated with bird, small mammal, and insect data	Associate different habitats with various species of birds, small mammals, and insects	Information will eventually allow the refuge to better predict how habitat disturbances may affect birds, small mammals, and insects	Habitat data collected according to Service data standards
How many moose are on the Refuge, and what is their population trend?	Population density	Detect changes in population levels and distribution that can affect population	Research potential causes of changes in populations Modify recreational and subsistence harvest regulations	Aerial surveys to determine population density at 1–3-year intervals Capture and fit with radio telemetry collars
How many wolves use the Refuge?	Number, size, and distribution of packs	Detect changes in number of packs, pack sizes, and distribution over time	Research potential causes of population changes	Aerial surveys in winter Capture and fit with radio telemetry collars
How many beaver are on the Refuge?	Number, distribution, and size of fall food caches	Detect changes in number and sizes of active caches	Research potential causes of change. Modify trapping regulations if needed	Aerial surveys Aerial photography

Inventory or Monitoring Question	Measured Characteristics	Goal(s) of Inventory or Monitoring Activity	Possible Management Actions	Possible Sampling Procedure
How does fire affect refuge resources?	Small mammal species diversity and population density Plant species diversity and structure Forest age Fire intensity	Document change in small mammal communities over time Document change in plant communities and habitats over time Document change in forest age and types over time Document change in area burned in different severity categories NA: baseline data	NA: baseline data Allows better prediction of fire effects based on refuge-specific information NA: baseline data Sampling on permanent plots	Sampling on permanent plots Collect tree ring data Satellite imagery and aerial photography
Are there any invasive plants on the Refuge?	Presence of invasive plants	Document location and diversity of invasive plants	Eradication	Directed searches and opportunistic observation
What are the trends in goose populations on the Refuge?	Number and distribution of molting interior greater white-fronted and Canada geese	Detect changes in goose numbers and/or distribution Provide data for regional investigations of interior greater white-fronted geese	Research potential causes of changes in numbers Modify recreational harvest regulations along flyway and/or subsistence harvest regulations in Alaska	Aerial line transect survey
How many swans utilize the Refuge?	Number of swans and cygnets on the refuge	Document number and distribution of swans and cygnets on refuge	Research potential causes of population changes	Aerial line transect surveys
What are the trends in land bird populations?	Species and number of birds	Collect data to contribute to statewide and nation-wide databases	Research potential causes of populations changes	Breeding bird survey routes
How many salmon migrate up the Yukon and Koyukuk rivers and into refuge streams?	Species and number of salmon passing through a weir	Collect data to contribute to management of Yukon River salmon fishery	NA: baseline data	Document species, numbers, sex ratio, and run timing of salmon passing a specific point

Chapter 5: Implementation and Monitoring

Inventory or Monitoring Question	Measured Characteristics	Goal(s) of Inventory or Monitoring Activity	Possible Management Actions	Possible Sampling Procedure
What parts of the Refuge do whitefish use on a seasonal basis?	Locations of broad and humpback whitefish and least cisco	Track movements of fish to identify migratory patterns, including spawning and wintering areas. Collect morphological and genetic data on whitefish	NA: baseline data Protect important seasonal habitats Document movement of fish to off-refuge sites	Radio telemetry
What are the current levels of visitor use on refuge lands and what are the trends?	Number of visitors and parties, lengths of stay, sites visited, and activities occurring on the refuge	Collect baseline data	NA: baseline data	Compile information from guide reports, air taxi operator reports, and staff observations
Is recreational use on the Refuge displacing subsistence users?	Number and type of displacement incidents observed or reported	Collect baseline data	Increase visitor education Work with guides, transporters, and subsistence users to resolve issues Modify stipulations on permits	Collect information from local residents, guides, air taxi operators, and staff
How will stream flow be protected to meet primary refuge purposes?	Stream discharge	Protect water quality and quantity	File and obtain water rights with the State	Stream gauging - year round for a minimum of 5 years

Inventory or Monitoring Question	Measured Characteristics	Goal(s) of Inventory or Monitoring Activity	Possible Management Actions	Possible Sampling Procedure
Is the known Hogatza River mining site leaking containments into the Koyukuk River?	Water quality downstream of mining sites	Collect baseline data	To be determined based upon findings	Measure water quality
How are visitors getting information on the Refuge, and are they finding the information they seek?	Type of information requested, information sources, information lacking	Collect baseline data	Modify methods of information retrieval to increase ease of use, sources, and types of information available	Invite users to complete a comment sheet/survey on the Web site Ask guides and air taxi operators to distribute surveys to their clients Distribute surveys at special events; staff conversations with visitors