

Draft Comprehensive Conservation Plan and Environmental Assessment

*Bamforth National Wildlife Refuge
Hutton Lake National Wildlife Refuge
Mortenson Lake National Wildlife Refuge*

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Prepared by

U.S. Fish and Wildlife Service

Arapaho National Wildlife Refuge Complex
953 Jackson County Road #32
Walden, CO 80448
970/723 8202

and

Region 6, Mountain–Prairie Region
Division of Refuge Planning
134 Union Boulevard, Suite 300
Lakewood, CO 80228
303/236 4305

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Acronyms and Abbreviations

Administration Act	National Wildlife Refuge System Administration Act of 1966
ABC	American Bird Conservancy
BBS	breeding bird survey
BCR	Bird Conservation Regions
CCC	Civilian Conservation Corps
CCP	comprehensive conservation plan
CFR	Code of Federal Regulations
cfs	cubic feet per second
CRP	conservation reserve program
CWCS	comprehensive wildlife conservation strategy
DNC	dense nesting cover
DU	Ducks Unlimited
EA	environmental assessment
EO	executive order
EPA	U.S. Environmental Protection Agency
FHWA	Federal Highway Administration
FMP	fire management plan
FONSI	finding of no significant impact
FTE	full-time equivalent
GIS	geographic information system
GPS	global positioning system
GS	general schedule (employment)
HAPET	Habitat and Population Evaluation Team
HMP	habitat management plan
IMPROVE	interagency monitoring of protected visual environments
Improvement Act	National Wildlife Refuge System Improvement Act of 1997
LWCF	Land and Water Conservation Fund
LPP	land protection plan
NABCI	North American Bird Conservation Initiative
NAWCA	North American Wetlands Conservation Act
NAWMP	North American Waterfowl Management Plan
NEPA	National Environmental Policy Act
NOI	notice of intent

NRCS	Natural Resources Conservation Service
NWI	national wetland inventory
NWR	national wildlife refuge
NWRS	National Wildlife Refuge System
PFW	Partners for Fish and Wildlife
PL	public law
PPJV	Prairie Pothole Joint Venture
PPR	prairie pothole region
Refuge System	National Wildlife Refuge System
region 6	Mountain–Prairie Region of the U.S. Fish and Wildlife Service
RONs	Refuge Operating Needs System
SAMMS	Service Asset Maintenance Management System
Service	U.S. Fish and Wildlife Service
SUP	special use permit
SWG	state wildlife grant
TMDL	total maximum daily load
TNC	The Nature Conservancy
UGHEP	upland gamebird habitat enhancement program
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WG	wage grade (employment)
WHIP	wildlife habitat incentive program
WPA	waterfowl production area
WMD	wetland management district
WUI	wildland–urban interface

Summary

This is a summary of the comprehensive conservation plan (CCP) for the Laramie Plains refuges in Albany County, Wyoming. The Laramie Plains refuges include Bamforth National Wildlife Refuge (NWR), Hutton Lake NWR, and Mortenson Lake NWR. This plan, approved in 2007, will guide management of the refuges for the next 15 years.

The National Wildlife Refuge System Improvement Act of 1997 (Improvement Act) requires the U.S. Fish and Wildlife Service (Service) to develop a comprehensive conservation plan by 2012 for each national wildlife refuge in the National Wildlife Refuge System (Refuge System).

THE REFUGES

The Laramie Plains refuges are managed by Service staff headquartered at the Arapaho NWR near Walden, Colorado. All three refuges are located within 15 miles of the town of Laramie, Wyoming.

Laramie is positioned in a high plains basin ecosystem known as the Laramie Basin. The shallow depressions of the basin, within the relatively flat topography of the region, support wetland complexes that are unique to the area. These wetland complexes provide resting, nesting, and breeding areas for migratory birds in the semiarid environment.

In the early 1930s, J. Clark Salyer III was charged with identifying areas to protect as national wildlife refuges for migratory birds. He surveyed the area around Laramie and selected two locations as national wildlife refuges for migratory birds. Bamforth NWR and Hutton Lake NWR were established by Executive Orders in 1932, within one day of each other.

Bamforth NWR comprises three separate parcels with private or state lands between them. The 1,166-acre refuge contains Bamforth Lake, but most of the lake falls outside the refuge boundary. No public use is allowed on Bamforth NWR.

Hutton Lake NWR consists of 1,928 acres and supports approximately 2,000 visits over the course of a year, mostly from March through October. Wildlife viewing opportunities and refuge access are limited from November through February due to frozen ponds and cold, snowy weather.

Mortenson Lake NWR was established in 1993 to protect the Wyoming toad's last known population.

The Wyoming toad was listed as an endangered species in 1984. Physical features of 1,968-acre refuge include Mortenson Lake, Soda Lake, and Gibbs Pond. Habitat types include open water, wetlands, wet meadow, grassland, sagebrush, and greasewood communities. No public use is currently allowed on the refuge to prevent potential adverse impact on the Wyoming toad.

THE PLANNING PROCESS

The CCP process consisted of a series of steps including environmental analysis. Public and partner involvement were encouraged and valued throughout the process. Management alternatives were developed to meet the purposes, vision, and goals of the refuges. Implementation of this CCP will be monitored throughout its 15-year effective period.



Refuge habitats include wet meadows and grasslands.

ISSUES

Public scoping for the Laramie Plains refuges initiated in 2006, along with refuge information, identified 10 major areas of concern regarding management of the refuges.

Refuge Uses

Refuge uses (grazing, recreation, transmission lines) need to be evaluated to ensure existing and proposed uses are compatible with the purpose of the refuges and mission of the Refuge System. Over time, with minimal staff presence, refuge uses have not been actively evaluated. Through the development of this CCP, refuge uses and management activities will be evaluated to ensure the best, most informed decisions are made for proper management of refuge lands.

(Applies to all three Laramie Plains refuges.)

Water Resources

Water and water availability are vital in semiarid regions. The limited water rights for these refuges can result in dry spring conditions and poor wildlife habitat for trust species. Acquiring additional water rights would enable the Service to consistently provide high-quality spring migration and nesting habitat for trust species. The Service needs to research the availability and feasibility of obtaining additional water rights for the refuges.

(Applies to all three Laramie Plains refuges.)

Invasive Species

Invasive species are a threat to quality habitat. If not contained early, they can also drain resources. Though the refuges do not have significant invasive species issues, vigilance is required. Tamarisk has been identified and managed at Hutton Lake NWR, but an increase in monitoring, management, and control of it and other invasive species is needed.

(Applies to all three Laramie Plains refuges.)

Research and Science

The Service needs to obtain good baseline biological information for the refuges. Monitoring programs need to be implemented for species that use the refuges. The University of Wyoming, located within 15 miles of the refuges, could be a partner in gathering quality research data on the refuges.

(Applies to all three Laramie Plains refuges.)

Land Protection

Areas of concern center on the small size of the individual refuges and a lack of buffer zones. Each refuge is less than 2,000 acres in size, and the refuges' proximity to Laramie and urban growth in

the area pose a potential threat. (Mortenson Lake NWR may already be affected by septic systems from a home site overlooking the lake.) Refuge advocates want to increase protections through conservation easements or expansions through willing seller acquisitions to ensure the refuges are large enough to preserve wildlife qualities.

(Applies to all three Laramie Plains refuges.)

Partnerships

Cooperation with other agencies is needed to address issues of common concern. Opportunities for the public to assist in protection and management of the refuges should be identified and provided.

(Applies to all three Laramie Plains refuges.)

Staffing

The refuges should be actively managed by Service staff stationed in Wyoming. This issue was raised frequently in public meetings. The managing staff is headquartered at Arapaho NWR in Walden, Colorado, an hour's drive south of Laramie.

The remote location and the small number of staff assigned to Arapaho NWR prevent active, consistent oversight of the Laramie Plains refuges.

(Applies to all three Laramie Plains refuges.)

Lack of Information

Bamforth NWR has not been actively managed since its establishment in 1932. The refuge is not properly posted, fenced, or signed to indicate its status as a national wildlife refuge. The planning team struggled with a lack of information regarding the refuge's wildlife and habitat resources. The planning team discussed whether Bamforth NWR should maintain its national wildlife refuge status. The Service's region 6 divestiture model was used to evaluate the refuge. The evaluation indicated the refuge should remain in the Refuge System, mainly due to insufficient information. The Service needs to obtain a good understanding of the refuge resources before advocating divestiture or promoting public use. With the possibility of recommending divestiture of the refuge in the future, it would not be prudent to fund the development of the infrastructure needed to provide public use opportunities at this time. This plan strives to identify the resources and potential of the refuge to determine its appropriate role in the Refuge System.

(Applies only to Bamforth NWR.)

Public Use

The public would like Hutton Lake NWR to provide wildlife-dependent recreation opportunities when compatible with the purpose of the refuge and mission of the Refuge System. The low-key, quiet, undeveloped nature of the refuge should be maintained. Consideration should be given to

nonconsumptive public uses (wildlife observation, wildlife photography, environmental education, interpretation), as other nearby public lands provide for consumptive uses. A visitor services management plan needs to be developed to address issues such as access, circulation, and signage. Public awareness of the benefits of protecting breeding and nesting areas for birds should be raised. *(Applies only to Hutton Lake NWR.)*

Endangered Species

Mortenson Lake NWR was established for the endangered Wyoming toad. Although the refuge staff participates on the Wyoming Toad Recovery Team, not having a staff member specifically assigned to the refuges has hindered management decisions and active, planned oversight of these lands for the Wyoming toad. *(Applies only to Mortenson Lake NWR.)*

THE FUTURE OF THE REFUGES

The issues, along with resource conditions, were important considerations during the development of the vision and goals for the Laramie Plains refuges.

The Vision of the Refuges

The wetland complexes and uplands of the Laramie Plains refuges are important resource components of this semiarid region that provide key habitat for the Wyoming toad, migratory birds, and resident wildlife.

The refuges will be evaluated to direct management decisions to provide natural and enhanced habitat, thereby maximizing the unique potential of each refuge. Wildlife-dependent recreation opportunities will be evaluated for each refuge to determine potential, appropriate public use opportunities.

Goals

The following goals were developed to meet the vision of the Laramie Plains refuges.

Research and Science Goal

Conduct natural resource management using sound science and applied research to advance the understanding of refuge resources and natural resource function. *(Applies to all three Laramie Plains refuges.)*

Partnerships Goal

Work with partners to determine the wildlife and habitat resources on the refuges, to maximize

wildlife habitat protection, and to increase understanding of wildlife needs, as well as the benefits wildlife offer to individuals and communities, on and off the refuges. *(Applies to all three Laramie Plains refuges.)*

Cultural Resources Goal

Identify and protect cultural resources on the refuges. *(Applies to all three Laramie Plains refuges.)*

Refuge Operations Goal

Secure and demonstrate the effective use of funding, staffing, and partnerships for the benefit of all resources in support of the refuges and the Refuge System. *(Applies to all three Laramie Plains refuges.)*

Natural Resources Goal

Conduct baseline surveys to identify refuge resources and the role these resources serve in the Laramie Basin ecosystem and the Refuge System. *(Applies only to Bamforth NWR.)*

Wetlands Goal

Manage refuge impoundments and other wetlands to create diverse habitat for wetland-dependent wildlife. *(Applies only to Hutton Lake NWR and Mortenson Lake NWR.)*

Uplands Goal

Evaluate and manage shrub and/or grass dominated uplands for benefits to migratory birds (willet, horned lark), white-tailed prairie dogs, pronghorn, and other wildlife. *(Applies only to Hutton Lake NWR and Mortenson Lake NWR.)*

Visitor Services Goal

Provide wildlife-dependent recreational opportunities to a diverse audience when the administration of these programs does not adversely affect habitat management objectives. *(Applies only to Hutton Lake NWR.)*

Wyoming Toad Goal

In conjunction with the Wyoming Toad Recovery Team, manage refuge lands around Mortenson Lake and other areas on the refuge as necessary to protect, create, and manage habitat suitable for Wyoming toad recovery from endangered status. *(Applies only to Mortenson Lake NWR.)*

Alternatives

The planning team developed the following three alternatives as management options for addressing the key issues.

Alternative A—Current Management (*No Action*)

This no-action alternative reflects the current management of the Laramie Plains refuges. It provides the baseline against which to compare the other alternatives.

Refuge habitats would continue to be minimally managed on an opportunistic schedule that may maintain—or most likely would result in further decline in—the diversity of vegetation and wildlife species. Only limited research and monitoring of refuge habitats and wildlife species would occur on the refuges.

Outreach, partnerships, and public uses (wildlife observation, wildlife photography, environmental education, and interpretation) would continue at present minimal levels.

Alternative B—Enhanced Refuge Management (*Proposed Action*)

Alternative B is the Service's proposed action and basis for the draft comprehensive conservation plan.

Management activities under alternative B would be increased. Upland habitats would be evaluated and managed for the benefit of migratory bird

species. Refuge staff would research the availability of additional water rights for the refuges, and consider obtaining additional water rights, where appropriate, for the benefit of wetland-dependent wildlife. Monitoring and management of invasive species on the refuges would be increased. Wildlife-dependent recreation opportunities would be provided and enhanced at Hutton Lake NWR where compatible with refuge purposes.

With additional staffing, the Service would collect baseline biological information for wildlife and habitats. Efforts would be increased in the operations and maintenance of natural resources on the refuges and to maintain and develop partnerships that promote wildlife and habitat research and management.

Alternative C—Partnerships

Under Alternative C, refuge staff would rely on partnerships to achieve refuge goals and objectives. Refuge management activities would be increased and enhanced through the use of partnerships. Refuge staff would strive to accomplish refuge work through partnerships with others. An emphasis on adaptive management, including monitoring the effects of habitat management practices and using research results to direct ongoing management, would be a priority.

1 Introduction

The U.S. Fish and Wildlife Service (Service, USFWS) has developed this draft comprehensive conservation plan (CCP) to provide a foundation for the management and use of the Laramie Plains refuges located in south east Wyoming near Laramie, Wyoming. The Laramie Plains refuges include Bamforth National Wildlife Refuge (NWR), Hutton Lake NWR, and Mortenson Lake NWR (figure 1). When finalized, the CCP will serve as a working guide for management programs and actions over the next 15 years.

This draft CCP was developed in compliance with the National Wildlife Refuge System Improvement Act of 1997 (Improvement Act) and Part 602 (National Wildlife Refuge System Planning) of “The Fish and Wildlife Service Manual.” The actions described within this draft CCP and environmental assessment (EA) meet the requirements of the National Environmental Policy Act of 1969 (NEPA). Compliance with the NEPA is being achieved through the involvement of the public.

The final CCP will specify the necessary actions to achieve the vision and purposes of the Laramie Plains refuges. Wildlife is the first priority in refuge management, and public use (wildlife-dependent recreation) is allowed and encouraged as long as it is compatible with the refuges’ purposes.

The draft CCP and the EA have been prepared by a planning team comprised of representatives from various Service programs (division of refuge planning, education and visitor services, ecological services), refuge staff, the Wyoming Toad Recovery Team, and the Wyoming Game and Fish Department. In addition, the planning team incorporated public input. Public involvement and the planning process are described in section 1.6 below.

After reviewing a wide range of public comments and management needs, the planning team developed alternatives for management of the refuges. The team recommended one alternative to be the Service’s proposed action. This action addresses all substantive issues while determining how best to achieve the purpose of the refuges. The proposed action is the Service’s recommended course of action for management of the refuges. The proposed action is summarized in chapter 3, with its predicted effects described in chapter 5. The details of the proposed action compose the draft CCP (chapter 6).

1.1 PURPOSE AND NEED FOR THE PLAN

The purpose of this draft CCP is to identify the role that the refuges will play in support of the mission of the National Wildlife Refuge System (Refuge System), and to provide long-term guidance for management of refuge programs and activities. The CCP is needed

- to communicate with the public and other partners in efforts to carry out the mission of the Refuge System;
- to provide a clear statement of direction for management of the refuges;
- to provide neighbors, visitors, and government officials with an understanding of the Service’s management actions on and around the refuges;
- to ensure that the Service’s management actions are consistent with the mandates of the Improvement Act;
- to ensure that management of the refuges is consistent with federal, state, and county plans;
- to provide a basis for development of budget requests for the refuges’ operation, maintenance, and capital improvement needs.

1.2 THE U.S. FISH AND WILDLIFE SERVICE AND THE NATIONAL WILDLIFE REFUGE SYSTEM

The Service is the principal federal agency responsible for fish, wildlife, and plant conservation. The Refuge System is one of the Service’s major programs.

The U.S. Fish and Wildlife Service

The mission of the U.S. Fish and Wildlife Service, working with others, is to conserve, protect, and enhance fish and wildlife and their habitats for the continuing benefit of the American people.

Over a century ago, America’s fish and wildlife resources were declining at an alarming rate. Concerned citizens, scientists, and hunting and angling groups joined together to restore and

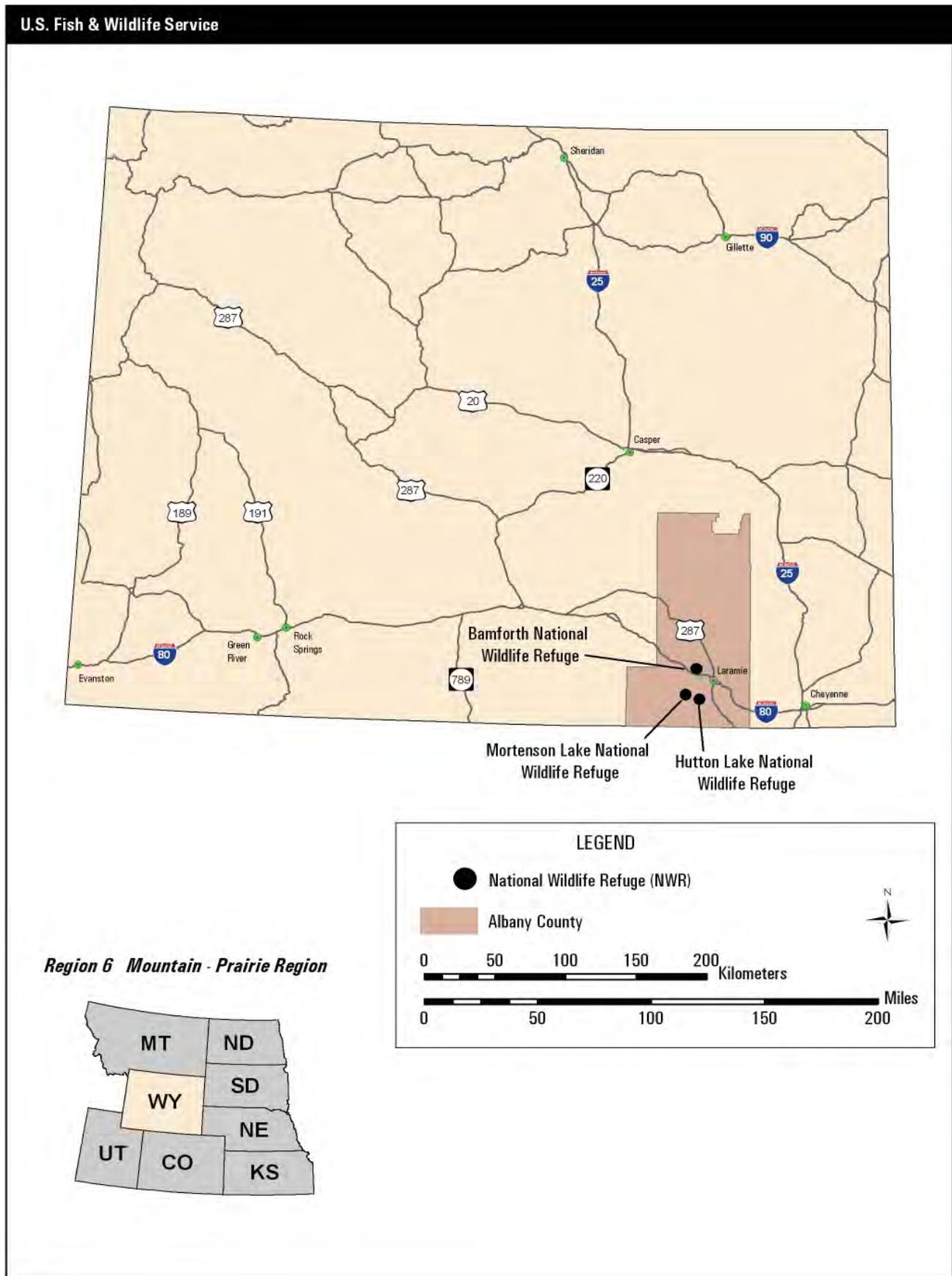


Figure 1. Vicinity map for Laramie Plains refuges, Wyoming.

sustain America's national wildlife heritage. This was the genesis of the U.S. Fish and Wildlife Service.

Today, the Service enforces federal wildlife laws, manages migratory bird populations, restores nationally significant fisheries, conserves and restores vital wildlife habitat, protects and recovers endangered species, and helps other governments with conservation efforts. In addition, the Service administers a federal aid program that distributes hundreds of millions of dollars to states for fish and wildlife restoration, boating access, hunter education, and related programs across America.

National Wildlife Refuge System

In 1903, President Theodore Roosevelt designated the 5.5-acre Pelican Island in Florida as the nation's first wildlife refuge for the protection of brown pelicans and other native, nesting birds. This small but significant designation was the beginning of the Refuge System.

One hundred years later, the Refuge System has become the largest network of lands in the world specifically managed for wildlife, encompassing over 96 million acres within 546 refuges and over 3,000 small areas for waterfowl breeding and nesting. Today, there is at least one refuge in every state as well as Puerto Rico, Guam, and the U.S. Virgin Islands.

In 1997, the Improvement Act established a clear mission for the Refuge System.

The mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

The Improvement Act states that each national wildlife refuge (that is, each unit of the Refuge System) shall be managed

- to fulfill the mission of the Refuge System;
- to fulfill the individual purposes of each refuge;
- to consider the needs of fish and wildlife first;
- to fulfill the requirement of developing a CCP for each unit of the Refuge System and fully involve the public in the preparation of these plans;

- to maintain the biological integrity, diversity, and environmental health of the Refuge System;
- to recognize that wildlife-dependent recreation activities including hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation, are legitimate and priority public uses;
- to retain the authority of refuge managers to determine compatible public uses.

In addition to the mission for the Refuge System, the wildlife and habitat vision for each unit of the Refuge System stresses the following principles:

- Wildlife comes first.
- Ecosystems, biodiversity, and wilderness are vital concepts in refuge and district management.
- Habitats must be healthy.
- Growth of refuges and wetland management districts must be strategic.
- The Refuge System serves as a model for habitat management with broad participation from others.

Following passage of the Improvement Act, the Service immediately began to carry out the direction of the new legislation, including preparation of CCPs for all national wildlife refuges and wetland management districts. Consistent with the Improvement Act, the Service prepares all CCPs in conjunction with public involvement. Each refuge and each district is required to complete its CCP within the 15-year schedule (by 2012).

People and the Refuge System

The nation's fish and wildlife heritage contributes to the quality of American lives. Wildlife and wild places provide special opportunities to recreate, relax, and enjoy the natural world.

Whether through bird watching, fishing, hunting, photography, or other wildlife pursuits, wildlife recreation contributes millions of dollars to local economies. In 2002, approximately 35.5 million people visited the Refuge System, mostly to observe wildlife in their natural habitats. Visitors are most often accommodated through nature trails, auto tours, interpretive programs, and hunting and fishing opportunities. Significant economic benefits are being generated to the local communities that surround refuges and wetland management districts. Economists report that Refuge System visitors contribute more than \$792 million annually to local economies.

1.3 NATIONAL AND REGIONAL MANDATES

Refuge System units are managed to achieve the mission and goals of the Refuge System, along with the designated purpose of the refuges and districts (as described in establishing legislation, executive orders, or other establishing documents). Key concepts and guidance of the Refuge System are in the Refuge System Administration Act of 1966 (Administration Act), Title 50 of the Code of Federal Regulations (CFRs), “The Fish and Wildlife Service Manual,” and the Improvement Act.

The Improvement Act amends the Administration Act by providing a unifying mission for the Refuge System, a new process for determining compatible public uses on refuges and districts, and a requirement that each refuge and district be managed under a CCP. The Improvement Act states that wildlife conservation is the priority of Refuge System lands and that the Secretary of the Interior will ensure the biological integrity, diversity, and environmental health of refuge lands are maintained. Each refuge and district must be managed to fulfill the Refuge System’s mission and the specific purposes for which it was established. The Improvement Act requires the Service to monitor the status and trends of fish, wildlife, and plants in each refuge and district.

A detailed description of these and other laws and executive orders that may affect the CCP or the Service’s implementation of the CCP is in appendix A. Service policies on planning and day-to-day management of refuges and districts are in the “Refuge System Manual” and “The Fish and Wildlife Service Manual.”

1.4 REFUGE CONTRIBUTIONS TO NATIONAL AND REGIONAL PLANS

The Laramie Plains refuges contribute to the conservation efforts described here.

Fulfilling the Promise

A 1999 report, “Fulfilling the Promise, The National Wildlife Refuge System” (U.S. Fish and Wildlife Service [USFWS] 1999), is the culmination of a yearlong process by teams of Service employees to evaluate the Refuge System nationwide. This report was the focus of the first national Refuge System conference in 1998 attended by refuge managers, other Service employees, and representatives from leading conservation organizations.

The report contains 42 recommendations packaged with three vision statements dealing with wildlife and habitat, people, and leadership. This CCP deals with all three of these major topics. The

planning team looked to the recommendations in the document for guidance during CCP planning.

Partners in Flight

The Partners in Flight program began in 1990 with the recognition of declining population levels of many migratory bird species. The challenge, according to the program, is managing human population growth while maintaining functional natural ecosystems. To meet this challenge, Partners in Flight worked to establish priorities for conservation efforts and identify land bird species and habitat types. Partners in Flight activity has resulted in 52 bird conservation plans covering the continental United States.

The primary goal of Partners in Flight is to provide for the long-term health of the bird life of North America. The first priority is to prevent the rarest species from going extinct, the second is to prevent uncommon species from descending into threatened status, and the third is to “keep common birds common.”

There are 58 physiographic areas, defined by similar physical geographic features, wholly or partially contained within the contiguous United States and several others wholly or partially in Alaska. The Laramie Plains refuges fall within physiographic area 86, the Wyoming Basin (see figure 2).

The Wyoming Basin is primarily in Wyoming but also extends into northern Colorado, southern Montana, and very small parts of northeast Utah and southeast Idaho. The area consists of broad intermountain basins interrupted by isolated hills and low mountains that merge to the south into a dissected plateau. The Wyoming Basin is primarily shrub–steppe habitat, dominated by sagebrush and shadscale, interspersed with areas of short-grass prairie. Higher elevations are in mountain shrub vegetation, with coniferous forest atop the highest areas. Priority bird populations and habitats of the Wyoming Basin include:

Shrub–Steppe

- Ferruginous hawk
- Prairie falcon
- Greater sage-grouse
- Cassin’s kingbird
- Sage thrasher
- Brewer’s sparrow
- Sage sparrow

Sagebrush Grasslands

- Swainson’s hawk
- Mountain plover
- McCowan’s longspur

Montane Shrub

Lewis's woodpecker
Virginia's warbler

Wetlands

American white pelican
Wilson's phalarope

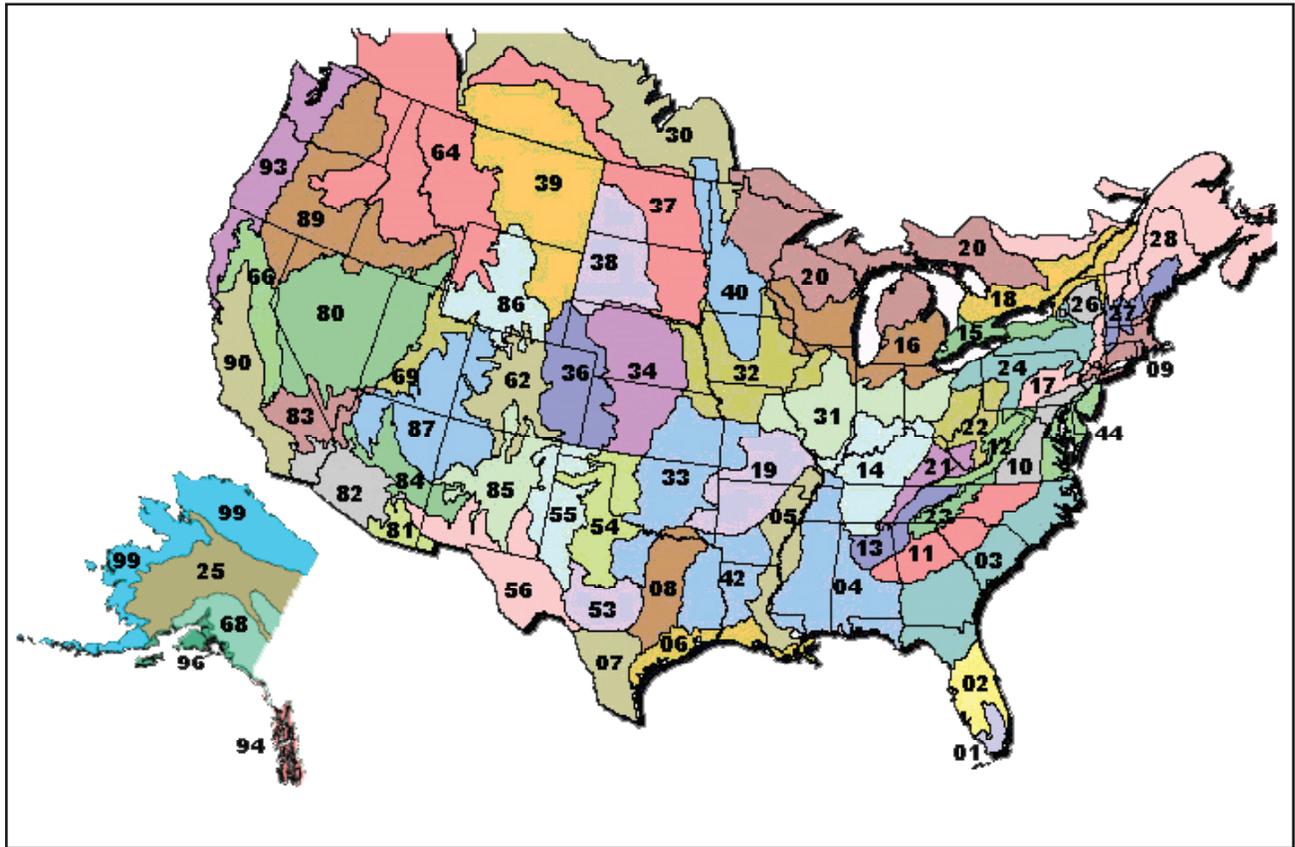


Figure 2. The Laramie Plains refuges are located in the Wyoming Basin, physiographic area 86.

Recovery Plans for Federally Listed Threatened or Endangered Species

Where federally listed threatened or endangered species occur at the Laramie Plains refuges, management goals and strategies in their respective recovery plans will be followed. The list of threatened or endangered species that occur at the refuges will change as species are listed or delisted, or as listed species are discovered on refuge lands.

The Wyoming Toad Recovery Plan (U.S. Fish and Wildlife Service [USFWS] 1991) is in effect at Mortenson Lake NWR, the only refuge covered by this CCP that provides habitat for the endangered Wyoming toad. Reports of Preble's meadow jumping mouse have been documented but not confirmed at Hutton Lake NWR, and no recent surveys have been conducted.

State Comprehensive Wildlife Conservation Strategy

Over the past several decades, documented declines of wildlife populations have occurred nationwide. Congress created the State Wildlife Grant (SWG) program in 2001. This program provides states and territories with federal dollars to support conservation aimed at preventing wildlife from becoming endangered and in need of protection under the Endangered Species Act. The SWG program represents an ambitious endeavor to take a proactive role in keeping species from becoming threatened or endangered in the future.

According to the SWG program, each state or territory and the District of Columbia must have been completed a comprehensive wildlife conservation strategy (CWCS) by October 1, 2005, to receive future funding.

These strategies will help define an integrated approach to the stewardship of all wildlife species, with additional emphasis on species of concern and habitats at risk. The goal is to shift focus from single-species management and highly specialized individual efforts to a geographically based, landscape-oriented, fish and wildlife conservation effort. The Service approves CWCSs and administers SWG program funding.

The CWCS for the state of Wyoming was reviewed and information therein was used during the development of the CCP. Implementation of CCP habitat goals and objectives will support the goals and objectives of the CWCS.

1.5 ECOSYSTEM DESCRIPTION AND THREATS

The Laramie Plains refuges are located within the Platte–Kansas Rivers ecosystem, which includes almost all of Nebraska, southeast Wyoming, northeast Colorado, and northern Kansas (figure 3). The ecosystem is home to the Nebraska Sandhills, the largest sand dune complex in the western hemisphere. This area and many others provide vital habitat for numerous threatened and endangered wildlife and plant species.

The ecosystem spans from snow-capped, barren mountain peaks in Colorado to lowland riparian cottonwood forests along the Missouri River in eastern Nebraska and Kansas. The mountainous regions are predominately a mixture of coniferous forests comprised of Douglas-fir, ponderosa pine, lodgepole pine, Engelmann spruce, and subalpine fir. Pinyon pine, juniper woodlands, and aspen communities are also common throughout. At high elevation, alpine meadows and lakes, willow shrublands, and barren, rocky areas are frequently found. Forests generally transition into shrub communities dominated by sagebrush with short grasses and forbs in eastern Wyoming and western Nebraska. Farther to the east, trees give way to short-grass prairie dominated by buffalo grass, blue gramma, hairy gramma, and western wheatgrass. The short-grass prairie turns into mixed-grass prairie in central Nebraska and Kansas, due primarily to greater annual rainfall. Many federally listed endangered and threatened species including the bald eagle, piping plover, whooping crane, and Eskimo curlew are found within this ecosystem. Threats to the Platte Kansas Rivers ecosystem that require attention include overgrazing of land, invasive plants in the area, population growth and housing development, and groundwater and surface water depletion. To overcome these threats, the priorities for the ecosystem will be to ensure that natural, healthy ecological processes dominate and that economic development complements environmental protection.

Refuge Relationship

The Laramie Plains refuges lie within the Laramie Basin. The Laramie Basin is at an elevation of between 7,200 and 7,500 feet above sea level; it is a semiarid, intermountain basin characterized by a predominant vegetation of short grasses and sagebrush.

1.6 THE PLANNING PROCESS

This draft CCP and the EA for the Laramie Plains refuges are intended to comply with the Improvement Act and the NEPA as well as the implementing regulations of the acts. The Service issued its Refuge System planning policy in 2000, which established requirements and guidance for refuge and district plans—including CCPs and step-down management plans—to ensure that planning efforts comply with the Improvement Act. The planning policy identified several steps of the CCP and environmental analysis process (see figure 4).

Table 1 displays the planning process to date for this draft CCP and EA. The Service began the preplanning process in January 2006. The planning team consists of Service personnel from various divisions including refuges, planning, education and visitor services, ecological services, and the Wyoming Game and Fish Department (see appendix B). During preplanning, the team developed a mailing list, internal issues, and a special qualities list. The planning team identified current refuge program status, compiled and analyzed relevant data, and determined the purpose of the refuges. Over the course of preplanning and scoping (the process of obtaining information from the public for input into the planning process), the planning team collected available information about the resources of the refuges and the surrounding areas. Chapter 4 summarizes this information.

The draft CCP (chapter 6) outlines long-term guidance for management decisions; sets forth proposed objectives and strategies to accomplish refuge purposes and meet goals; and identifies the Service's best estimate of future needs.

The draft CCP details program levels that are sometimes substantially above current budget allocations and, as such, are primarily for Service strategic planning purposes.

A notice of intent (NOI) to prepare the draft CCP and EA was published in the "Federal Register" on June 16, 2006. Public scoping began in May 2006 with public meetings in Casper and Laramie, Wyoming.

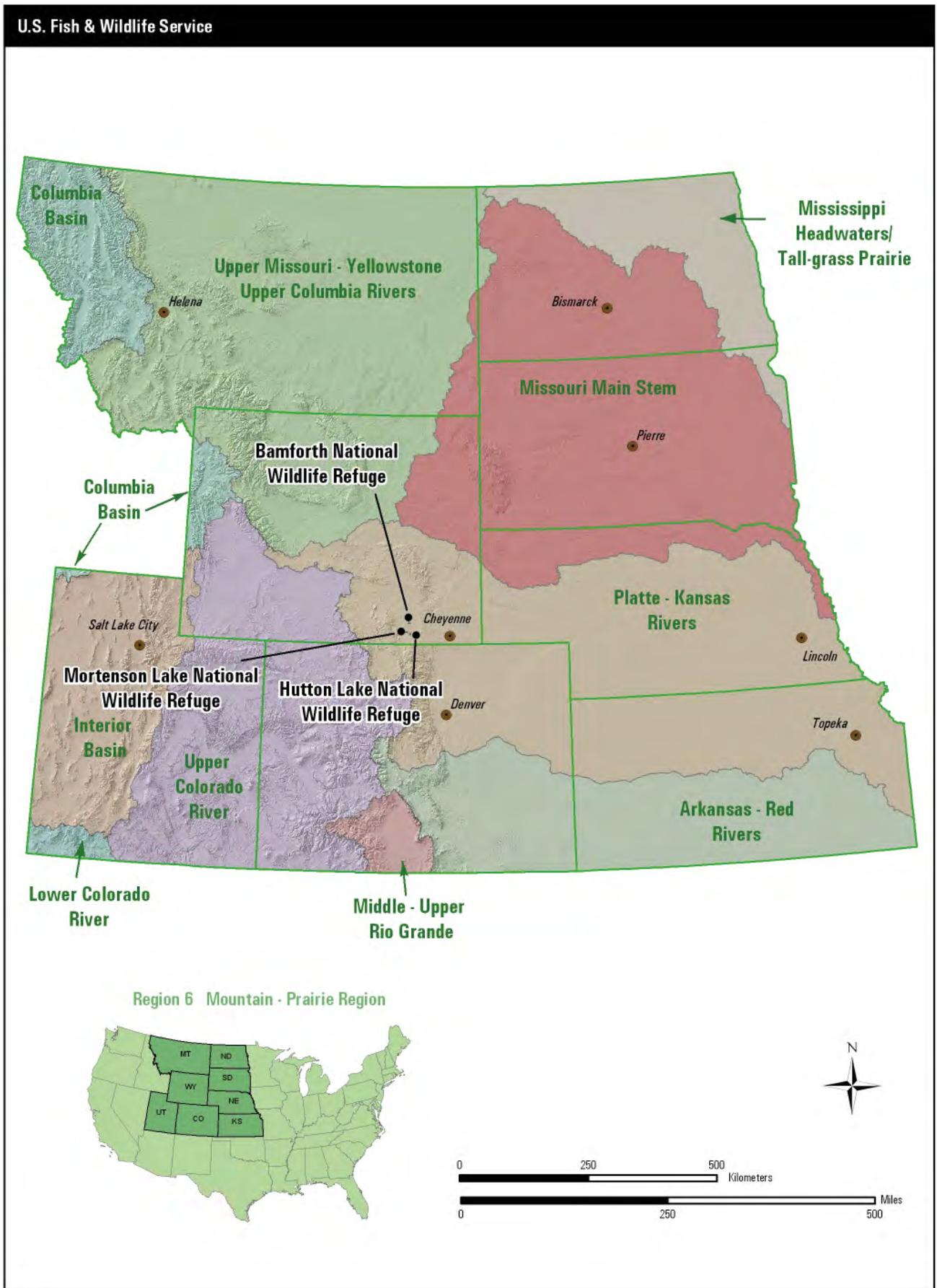


Figure 3. Platte–Kansas Rivers ecosystem.

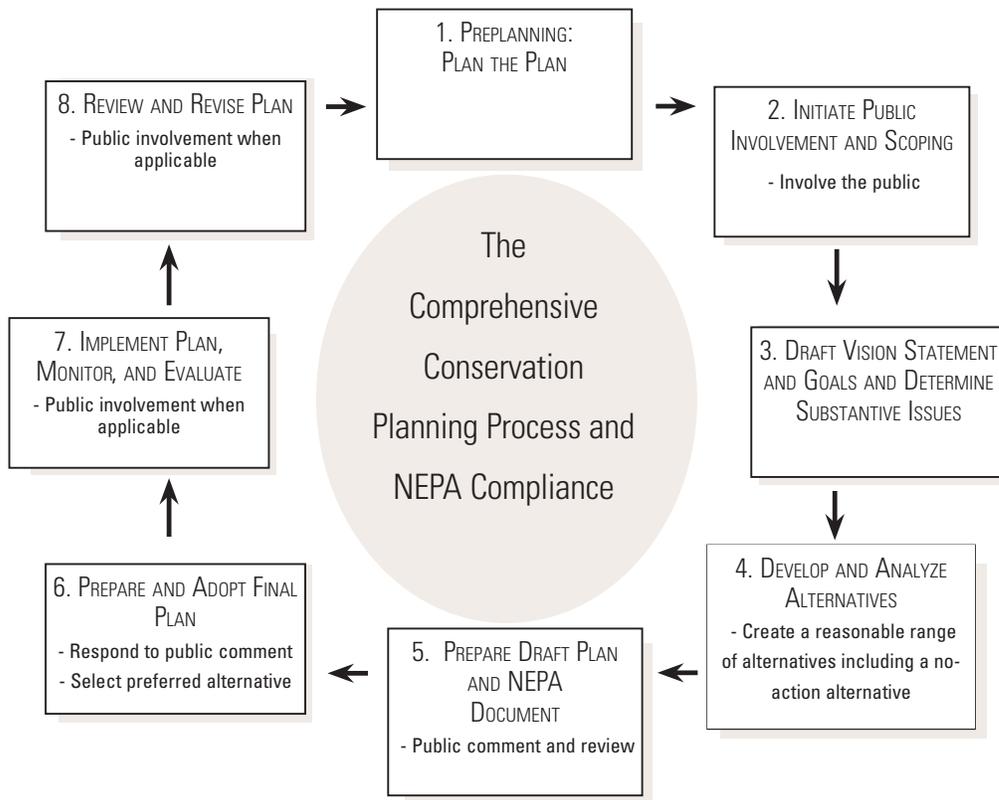


Figure 4. The planning process.

Table 1. Planning process summary for the Laramie Plains refuges, Wyoming.

Date	Event	Outcome
January–March 2006	Preplanning	CCP overview; established planning team; identified purpose of the refuges, history, and establishing authority; developed planning schedule and CCP mailing list.
March 23, 2006	Kickoff meeting	Toured refuges; conducted internal scoping by developing issues and qualities list for the refuges; identified biological and mapping needs; developed a vision statement for the refuges.
May 8, 2006	News release for public meeting sent to Wyoming media contacts	Notified public of opportunities for involvement in the CCP process.
May 24, 2006	Public meeting in Casper, WY	Opportunity for the public to learn about the CCP and offer suggestions on the scope of issues to be considered in the planning process.
May 25, 2006	Public meeting in Laramie, WY	Opportunity for the public to learn about the CCP and offer suggestions on the scope of issues to be considered in the planning process.
June 16, 2006	NOI (to prepare the CCP) published in the “Federal Register”	Notified the public of the intention to prepare a CCP and EA for the Laramie Plains refuges.
July 27, 2006	Goals and alternatives workshop	Goals developed; alternatives discussed.
September 2006	Planning update distributed to CCP mailing list	Planning update (describing CCP process and providing opportunity for public suggestions on the scope of issues to be considered in the planning process).
September 26, 2006	Environmental consequences workshop and identification of the proposed action	Reviewed the anticipated environmental consequences; identified alternative B as the proposed action.
October 20, 2006	Objectives workshop	Reviewed the proposed objectives, strategies, and rationale for implementation of the proposed action (draft CCP).
June 2007	Internal review of the draft CCP and EA	Received comments on the draft CCP and EA.
Summer 2007	Release of draft CCP and EA for public review	Draft CCP and EA presented to the public; received comments on the revised draft CCP and EA.
Summer 2007	Public meeting in Laramie, WY	Increased public understanding of the draft CCP and EA; received public comments about the draft CCP and EA.

Coordination with the Public

The Service held two public scoping meetings in May 2006 (see table 1 for details) announced by the local media. During the public meetings, a description of the CCP and NEPA process was provided. Participants were asked to provide suggestions on the scope of issues to be considered in the planning process, and comments were recorded and entered in the planning record. Attendees were encouraged to ask questions and offer comments; each attendee was given a comment form to submit additional thoughts or questions in writing.

Approximately 51 people attended the public meetings. Attendees included local citizens and members of Laramie Audubon Society, Wyoming Outdoor Council, and Biodiversity Conservation Alliance.

Written comments were due July 17, 2006. A total of 70 written comments were received throughout the scoping process. Input obtained from meetings and correspondence including email was considered in development of this draft CCP and EA.

A mailing list of more than 148 contacts includes private citizens; local, regional, and state government representatives and legislators; other federal agencies; and interested organizations (see appendix C).

In September 2006, the first planning update was sent to everyone on the mailing list. Information was provided on the history of the refuges and the CCP process, along with an invitation to share ideas regarding refuge management with the planning team. Each planning update included a comment form and postage-paid envelope to give the public an opportunity to provide written comments.

State Coordination

On January 27, 2006, an invitation letter to participate in the CCP process was sent by the Service's region 6 director to the director of the Wyoming Game and Fish Department (WGF). Two representatives from the WGF are part of the CCP planning team. Local WGF wildlife biologists and the refuge staff had established excellent and ongoing working relations before starting the CCP process.

The Wyoming Game and Fish Department is charged with providing "an adequate and flexible system for the control, management, protection, and regulation of all Wyoming wildlife." The WGF maintains 36 Wildlife Habitat Management Areas and 96 Public Access Areas, encompassing 410,000 acres of managed lands for wildlife habitat and public recreation opportunity. These lands contain 121 miles of stream easements and about 21,014 surface acres of lakes and reservoirs for public access.

Tribal Coordination

On October 17, 2006, five Native American tribal governments (Arapaho, Crow, Northern Cheyenne, Oglala Sioux, and Shoshone) were contacted through a letter signed by Service's region 6 director. With information about the upcoming CCP, the letter invited tribal recipients to serve on the planning team. Although Native American tribal governments did not express interest in participating on the planning team, the tribal governments remain on the CCP mailing list and will continue to receive CCP correspondence (planning updates, draft CCP and EA, final CCP) and will be given an opportunity to comment on the draft CCP and EA documents.

Results of Scoping

Table 1 summarizes all scoping activities. Comments collected from scoping meetings and correspondence, including comment forms, were used in the development of a final list of issues to be addressed in this draft CCP and EA.

The Service determined which alternatives could best address these issues. The planning process ensures that issues with the greatest effect on the refuges are resolved or given priority over the life of the final CCP. Identified issues, along with a discussion of effects on resources, are summarized in chapter 2.

In addition, the Service considered suggested changes to current refuge management presented by the public and other groups.

2 The Refuges

2.1 ESTABLISHMENT, ACQUISITION, AND MANAGEMENT HISTORY

The Laramie Plains refuges are managed by Service staff headquartered at the Arapaho NWR near Walden, Colorado. All three refuges are located within 15 miles of the town of Laramie, Wyoming.

Laramie is positioned in a high plains basin ecosystem known as the Laramie Basin. The shallow depressions of the basin, within the relatively flat topography of the region, support wetland complexes that are unique to the area. These wetland complexes provide resting, nesting, and breeding areas for migratory birds in the semiarid environment.

In the early 1930s, J. Clark Salyer III was charged with identifying areas to protect as national wildlife refuges for migratory birds. He surveyed the area around Laramie and selected two locations as national wildlife refuges for migratory birds. Bamforth NWR and Hutton Lake NWR were established by Executive Orders in 1932 within one day of each other.

Bamforth NWR was established on January 29, 1932, by Executive Order 9321. Consisting of 1,166 acres, the refuge is located approximately 6 miles northwest of Laramie. The refuge was established with 201 acres withdrawn from the public domain in 1932, and 965 acres purchased with Migratory Bird Conservation Act (Migratory Bird) funds in 1933.

Due to a number of factors, Bamforth NWR has remained within the Refuge System but has not been actively managed. The refuge comprises three parts arranged roughly in an L-shaped pattern, with the two segments one-half mile apart. Lands adjacent to and in between refuge parcels are owned by the state of Wyoming and private parties. The refuge is located in a closed basin hydrologic system that contains Bamforth Lake, but most of the lake falls outside the refuge boundary. The fragmented parcels, closed basin hydrology, and minimal water rights have contributed to the lack of active management of this refuge.

Hutton Lake NWR was established on January 28, 1932, by Executive Order 5782. Consisting of 1,928 acres, the refuge is located approximately 10 miles southwest of Laramie, Wyoming. In 1932, 153 acres were withdrawn from the public domain for the establishment of this refuge. Additional lands were purchased with Migratory Bird funds in

1933 and 1939. In 1940, 147 acres were exchanged, which completed the current 1,928 acres comprising Hutton Lake NWR. Physical features of the refuge include Hutton Lake, Rush Lake, Creighton Lake, and Lake George. Mallards, redheads, teal, pintails, great blue herons, black-crowned night-herons, phalaropes, western grebes, bitterns, and black terns use the refuge during fall and spring migrations.

With some water rights at Hutton Lake NWR the Service manages Lake George and Creighton, Hutton, Hoge, and Rush lakes for migratory birds. Water management is opportunistic due to limited water rights and a closed basin system. Ponds are filled in the spring with natural runoff and maintained as high as possible over the birds' breeding and brood-rearing seasons (June–August).

Hutton Lake NWR supports approximately 2,000 visits over the course of a year, mostly from March through October. Wildlife viewing opportunities and refuge access is limited from November through February due to frozen ponds and cold, snowy weather.

Mortenson Lake NWR was established in 1993 under the Endangered Species Act to protect the endangered Wyoming toad. The Service purchased an additional 151 acres for the refuge in 2003. The 1,968-acre refuge is located 15 miles southwest of Laramie. Within the refuge's approved acquisition boundary, 598 acres remain in private ownership. Protection for the Wyoming toad would improve if the Service could purchase these lands from willing sellers. Physical features of the refuge include Mortenson, Soda, and Garber lakes and Gibbs Pond. Last Chance, Osterman, and South ditches cross the refuge. Habitat types include open water, wetlands, wet meadow, grassland, sagebrush, and greasewood communities.

2.2 SPECIAL VALUES OF THE REFUGES

Early in the planning process, the planning team and public identified the outstanding qualities of the Laramie Plains refuges, the characteristics and features that make it special to people, valuable for wildlife, and worthy of refuge status. Identifying these values at the outset helps ensure they will be preserved, protected, and enhanced throughout the planning process. Refuge qualities can range from providing a unique biological habitat for wildlife to offering visitors a quiet place to observe a variety of

birds and enjoy nature. The following summarizes the qualities that make the Laramie Plains refuges unique and valued:

- The wetland complexes of the refuges provide important water resources that support resting, nesting, and foraging areas for migratory birds in the semiarid environment of the Laramie Plains basin.
- A diversity of wetland habitat within the refuges provides a range of conditions (i.e., varying amounts of emergent and aquatic vegetation, salinity, and open water) that support a variety of wildlife species.
- The nearby University of Wyoming and Colorado State University are resources for natural resource studies to add to the body of scientific literature on semiarid environments and the importance of national wildlife refuges in the western United States.
- Two vegetative species of concern have been identified on Mortenson Lake NWR and Hutton Lake NWR. Alkali wildrye is a meadow grass at its northern limits. Pale blue-eyed grass is a wet-meadow plant in the iris family endemic to southeastern Wyoming and northcentral Colorado.
- The refuges contain native short-grass prairie habitat, which is unique in the state of Wyoming (species of special concern that use short-grass prairie include mountain plover, burrowing owl, sage-grouse, and McCown's longspur).
- The refuges are located near an urban population center (Laramie) and can be used as outdoor classrooms to provide environmental education opportunities for the local community.
- Visitors can find wide-open spaces that remain relatively undisturbed, and may often feel as if they have the place to themselves.
- The refuges are designated as Important Bird Areas by the Wyoming Audubon Society.
- Mortenson Lake NWR harbors the endangered Wyoming toad.

2.3 PURPOSE

Every refuge is established for a purpose. This purpose is the foundation upon which to build all refuge programs, from biology and public use

to maintenance and facilities. No action that the Service or public takes may conflict with this refuge purpose. The refuge purpose is found in the legislative acts or administrative orders, which are the authorities to either transfer or acquire a piece of land for a refuge. Over time an individual refuge may contain lands that have been acquired under a variety of transfer and acquisition authorities, giving it more than one purpose. The goals, objectives, and strategies identified in the CCP are intended to support the individual purpose for which the refuge was established.

Bamforth NWR was established by Executive Order 5783, January 29, 1932 (figure 5). The purpose of the refuge is to provide “*a refuge and breeding ground for birds and wild animals.*” Hutton Lake NWR was established by Executive Order 5782, January 28, 1932 (figure 6). The purpose of the refuge is to provide “*a refuge and breeding ground for birds and wild animals.*”

Mortenson Lake NWR was established in 1993 to protect the Wyoming toad's last known population (figure 7). The Wyoming toad was listed as an endangered species in 1984. The population at Mortenson Lake was found in 1987. The purpose of the refuge is “*to conserve fish or wildlife which are listed as endangered species or threatened species.*”

2.4 VISION

At the beginning of the planning process, the Service developed a vision for the Laramie Plains refuges. A vision describes what will be different in the future as a result of the CCP and is the essence of what the Service is trying to accomplish at the refuges. The vision is a future-oriented statement designed to be achieved through refuge management by the end of the 15-year CCP planning horizon. The vision for the Laramie Plains refuges is:

The wetland complexes and uplands of the Laramie Plains refuges are important resource components of this semiarid region that provide key habitat for the Wyoming toad, migratory birds, and resident wildlife.

These refuges will be evaluated to direct management decisions to provide natural and enhanced habitat, thereby maximizing the unique potential of each refuge. Wildlife-dependent recreation will be evaluated for each refuge to determine potential, appropriate public use opportunities.

2.5 GOALS

The Service also developed a set of goals for the refuges based on the Improvement Act, the refuge

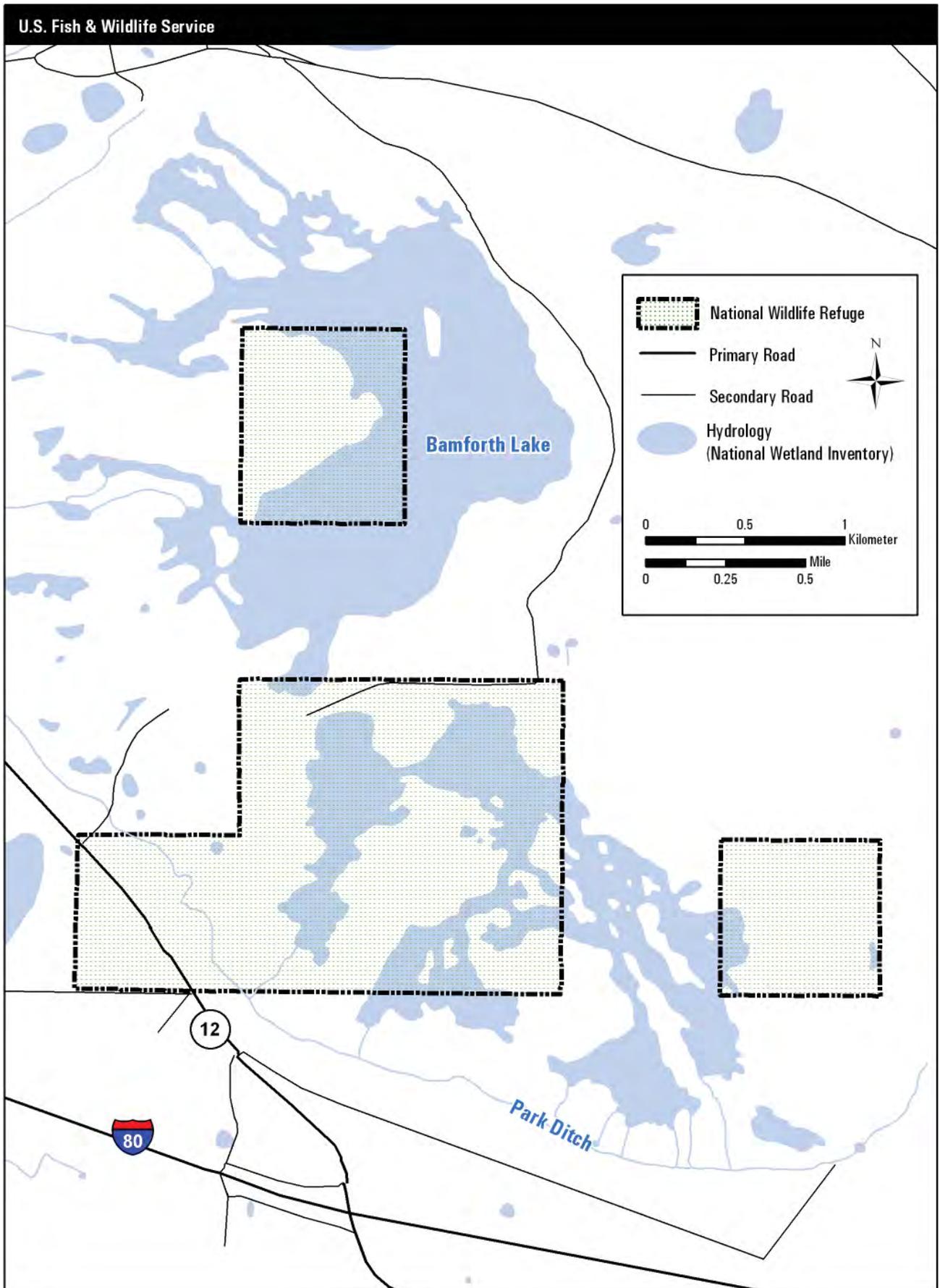


Figure 5. Base map of Bamforth NWR, Wyoming.

purposes, and information developed during project planning. The goals direct work toward achieving the vision and purpose of the refuge and outline approaches for managing refuge resources. The goals for the refuges are detailed below.

Bamforth NWR, Hutton Lake NWR, and Mortenson Lake NWR

The following goals apply to all three Laramie Plains refuges.

Research and Science Goal: Conduct natural resource management using sound science and applied research to advance the understanding of natural resource function.

Partnerships Goal: Work with partners to determine the wildlife and habitat resources on the refuges, to maximize wildlife habitat protection, and to increase understanding of wildlife needs, as well as the benefits wildlife offer to individuals and communities, on and off the refuges.

Cultural Resources Goal: Identify and protect cultural resources on the refuge.

Refuge Operations Goal: Secure and demonstrate the effective use of funding, staffing, and partnerships for the benefit of all resources in support of the refuges and the Refuge System.

Bamforth NWR

The following refuge-specific goal was identified for Bamforth NWR.

Natural Resources Goal: Conduct baseline surveys to identify refuge resources and the role they serve in the Laramie Basin ecosystem and the Refuge System.

Hutton Lake NWR

The following refuge-specific goals were identified for Hutton Lake NWR.

Wetlands Goal: Manage refuge impoundments and other wetlands to create a diverse habitat for wetland-dependent wildlife.

Uplands Goal: Gather baseline biological information to guide evaluation and management of shrub- and grass-dominated uplands for benefit to migratory birds (willet, horned lark), white-tailed prairie dogs, pronghorn, and other wildlife.

Visitor Services Goal: Provide wildlife-dependent recreational opportunities to a diverse audience when the administration of these programs does not adversely affect habitat management objectives.

Mortenson Lake NWR

The following refuge-specific goals were identified for Mortenson Lake NWR.

Wyoming Toad Goal: In conjunction with the Wyoming Toad Recovery Team, manage refuge lands around Mortenson Lake and other areas, on the refuge, as necessary to protect, create, and manage habitat suitable for Wyoming toad recovery from endangered status.

Wetlands Goal: Following considerations for Wyoming toad needs, manage refuge impoundments and other wetlands to create diverse habitat for wetland-dependent wildlife.

Uplands Goal: Following consideration for Wyoming toad needs, gather baseline biological information to guide evaluation and management of shrub- and grass-dominated uplands for the benefit of migratory birds, white-tailed prairie dogs, pronghorn, and other wildlife.

2.6 PLANNING ISSUES

Several key issues were identified following the analysis of comments collected from refuge staff and the public, as well as a review of the requirements of the Improvement Act and the NEPA. Substantive comments (those that could be addressed within the authority and management capabilities of the Service) were considered during the formulation of the alternatives for future management. These key issues for the Laramie Plains refuges are summarized below.

Bamforth NWR, Hutton Lake NWR, and Mortenson Lake NWR

The following planning issues apply to all three Laramie Plains refuges.

Refuge Uses

Refuge uses (grazing, recreation, transmission lines) need to be evaluated to ensure existing and proposed uses are compatible with the purpose of the refuges and mission of the Refuge System. Refuge uses have not been actively evaluated over time due to minimal staff presence. Through the development of this CCP, refuge uses and management activities will be evaluated to ensure the best, most informed decisions are made for proper management of refuge lands.

Water Resources

Water and water availability are vital in semiarid regions. The limited water rights for these refuges can result in dry spring conditions and poor wildlife

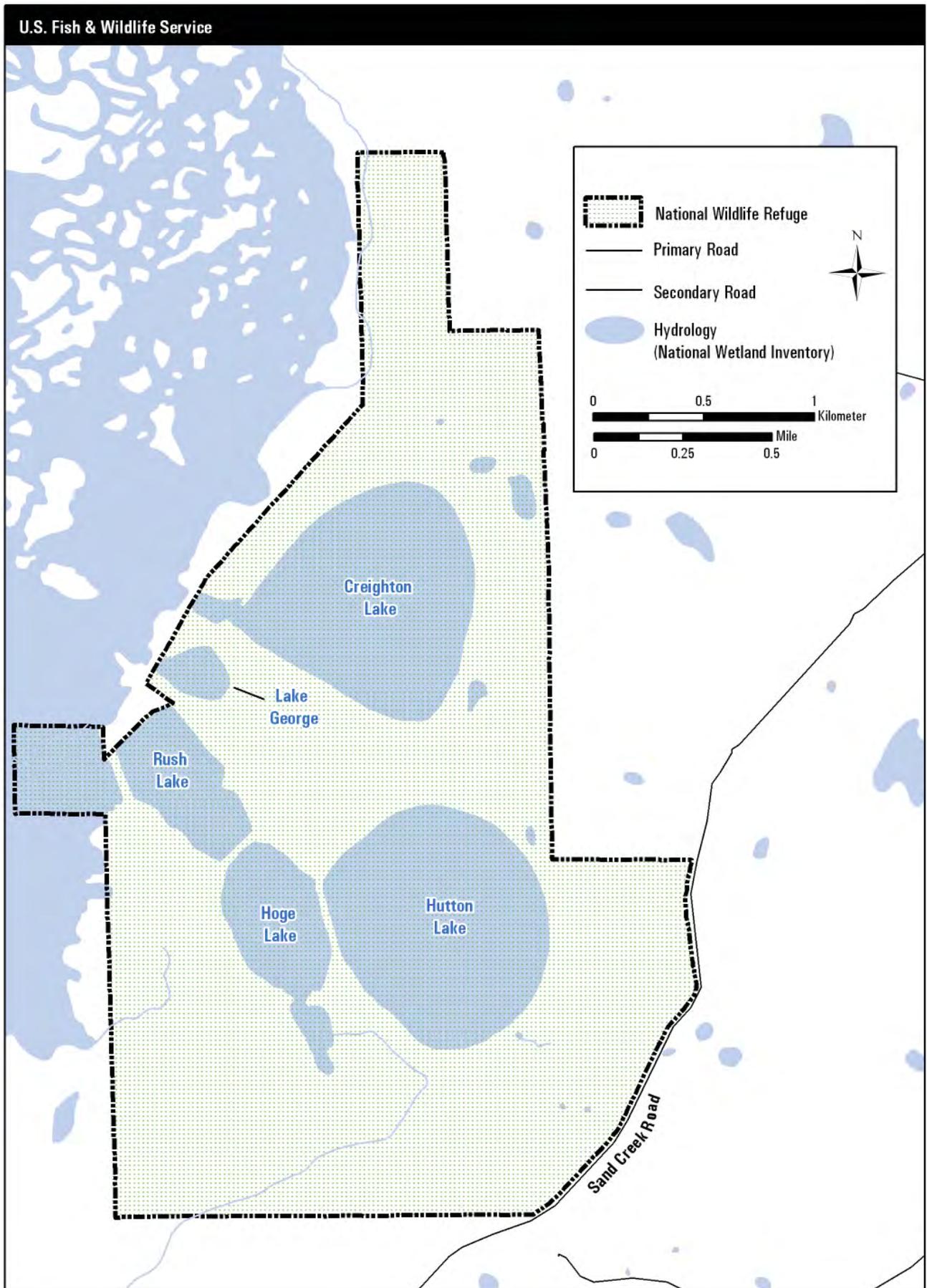


Figure 6. Base map of Hutton Lake NWR, Wyoming.

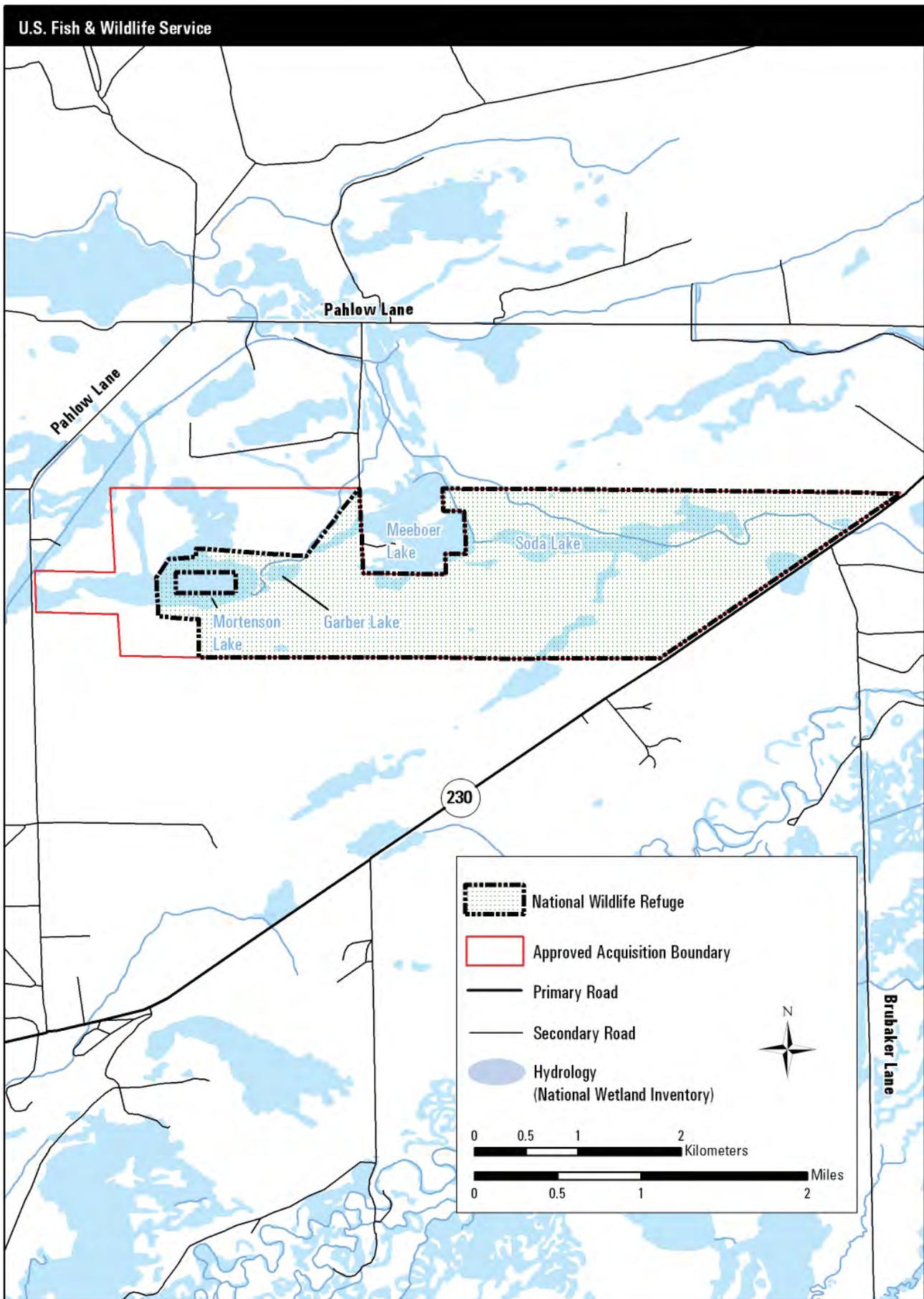


Figure 7. Base map of Mortenson Lake NWR, Wyoming.

habitat for trust species. Acquiring additional water rights would enable the Service to consistently provide high-quality spring migration and nesting habitat for trust species. The Service needs to research the availability and feasibility of obtaining additional water rights for the refuges.

Invasive Species

Invasive species are a threat to quality habitat. If not contained early, they can also drain resources. Though the refuges do not have significant invasive species issues, vigilance is required. Tamarisk has been identified and managed at Hutton Lake NWR, but an increase in monitoring, management, and control of it and other invasive species is needed.

Research and Science

The Service needs to obtain good baseline biological information for the refuges. Monitoring programs need to be implemented for species that use the refuges. The University of Wyoming, located within 15 miles of the refuges, could be a partner in gathering quality research data on the refuges.

Land Protection

Areas of concern center on the small size of the individual refuges and a lack of buffer zones. Each refuge is less than 2,000 acres in size, and the refuges' proximity to Laramie and urban growth in the area pose a potential threat. (Mortenson Lake NWR may already be affected by septic systems from a home site overlooking the lake.) Refuge advocates want to increase protections through conservation easements or expansions through willing seller acquisitions to ensure the refuges are large enough to preserve wildlife qualities.

Partnerships

Cooperation with other agencies is needed to address issues of common concern. Opportunities for the public to assist in protection and management of the refuges should be identified and provided.

Staffing

The refuges should be actively managed by Service staff stationed in Wyoming. This issue was raised frequently in public meetings. The managing staff is headquartered at Arapaho NWR in Walden, Colorado, an hour's drive south of Laramie. The remote location and the small number of staff assigned to Arapaho NWR prevent active, consistent oversight of the Laramie Plains refuges.

Bamforth NWR

The following planning issue applies only to Bamforth NWR.

Lack of Information

Bamforth NWR has not been actively managed since its establishment in 1932. The refuge is not properly posted, fenced, or signed to indicate its status as a national wildlife refuge. The planning team struggled with a lack of information about the refuge's wildlife and habitat resources. The planning team discussed whether Bamforth NWR should maintain its national wildlife refuge status. The Service's region 6 divestiture model was used to evaluate the refuge. The evaluation indicated the refuge should remain in the Refuge System, mainly due to insufficient information. The Service needs to obtain a good understanding of the refuge resources before advocating divestiture or promoting public use. With the possibility of recommending divestiture of the refuge in the future, it would not be prudent to fund the development of the infrastructure needed to provide public use opportunities at this time. This plan strives to identify the resources and potential of the refuge to determine its appropriate role in the Refuge System.

Hutton Lake NWR

The following planning issue applies only to Hutton Lake NWR.

Public Use

The refuge is currently closed to public use and is not signed or fenced to mark the refuge boundaries. Until baseline biological information has been obtained to determine the role the refuge plays in the Refuge System, and whether divestiture of the refuge is warranted, it would not be prudent to invest resources in the development of infrastructure to safely support public use programs.

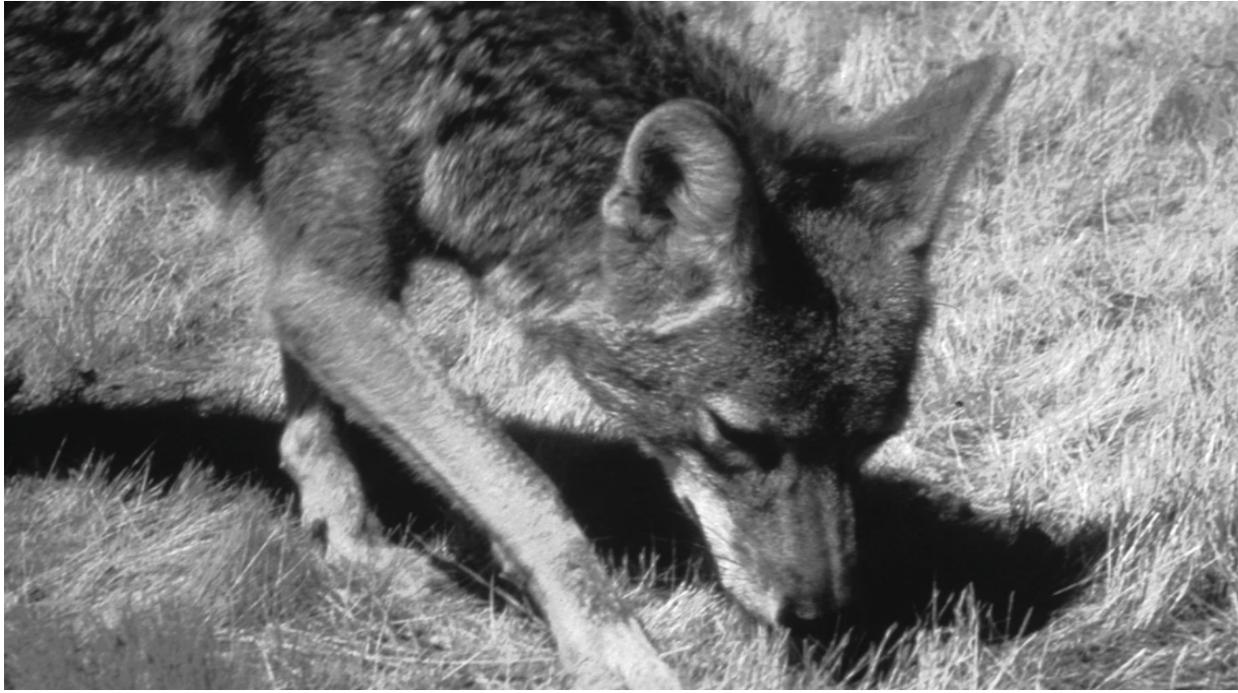
Mortenson Lake NWR

The following planning issue applies only to Mortenson Lake NWR.

Endangered Species

Mortenson Lake NWR was established for the endangered Wyoming toad. Although the refuge staff participates on the Wyoming Toad Recovery Team, not having a staff member specifically assigned to the refuges has hindered management decisions and active, planned oversight of these lands for the Wyoming toad.

3 Alternatives



USFWS

Coyote

This chapter describes the management alternatives considered for the Laramie Plains refuges. Alternatives are different approaches to planning unit management designed to achieve:

- the refuges' purposes, vision, and goals
- the mission of the Refuge System
- the mission of the Service

3.1 ALTERNATIVES DEVELOPMENT

Alternatives are formulated to address the significant issues, concerns, and problems identified by the Service, the public, and the governmental partners during public scoping and throughout the development of the draft plan.

This chapter contains the following sections:

- elements common to all alternatives
- description of alternatives
- summary of alternatives and environmental consequences (table 2)

This chapter describes three management alternatives that represent different approaches to

enhance protection and restoration of fish, wildlife, plants, habitats, and other resources. Alternative A, the no-action alternative, describes ongoing refuge management. The no-action alternative is a basis of comparison with alternatives B and C. Alternative B is the Service's proposed action and basis for the draft CCP (chapter 6).

The planning team assessed biological conditions and external relationships affecting the refuges. This information contributed to the development of alternatives, each of which presents a unique approach for addressing long-term goals. Each alternative was evaluated based on expected progress in meeting the vision and goals of the refuges and how it would address core wildlife and habitat issues and threats. Where data are available, trends in habitat and wildlife are evaluated, and the environmental consequences of each alternative are projected.

3.2 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

During the preplanning phase of the CCP process, Bamforth NWR was identified as a candidate for divestiture from Refuge System.

The planning team analyzed the refuge using region 6's divestiture model, which offers a set of criteria to measure the value of a refuge. Designed as a preplanning tool, the model allows planners and refuge managers to determine whether a refuge should be considered for divestiture. If the model indicates that a refuge should be considered for divestiture, the process and consequences of divestiture would be studied further during the CCP process.

In the case Bamforth NWR, the divestiture model indicated that the planning team did not have enough knowledge of existing refuge resources to answer the questions with a high degree of confidence. The planning team was reluctant to consider divestiture of Bamforth NWR without fully understanding the possible effects to the environment and the Refuge System.

Following the divestiture analysis (see appendix D), the planning team decided to retain Bamforth NWR in the Refuge System, and the alternative to divest Bamforth NWR from the Refuge System was eliminated from detailed study.

3.3 ELEMENTS COMMON TO ALL ALTERNATIVES

Several elements of refuge management are common to all alternatives. Management activities that could affect natural, archaeological, and historical resources would comply with applicable laws, regulations, and policies.

All alternatives would provide equal protection and management of cultural resources. Individual projects may require additional consultation with the Wyoming State Historic Preservation Office. Additional consultation, surveys, and clearance may be required when activities could affect properties eligible for the National Historic Register.

3.4 DESCRIPTION OF ALTERNATIVES

Management actions to advance the mission of the Refuge System and the purpose and vision of the Laramie Plains refuges are summarized below. The alternatives reflect options to address significant threats, problems, and issues raised by public agencies, private citizens, and interested organizations.

Each alternative differs in its ability to achieve long-term wildlife and habitat goals. However, each is similar in its approach to managing the refuges. Each alternative

- would pursue the goals outlined in chapter 2;
- would protect and enhance a diverse assemblage of habitats;

- would be consistent with the purpose of the refuges and with the mission and goals of the Refuge System.

The focus and actions for each of alternatives A–C are described below.

Alternative A—Current Management (*No Action*)

Alternative A, the no-action alternative, reflects the current management of the Laramie Plains refuges. It provides the baseline against which to compare other alternatives. It is also a requirement of the NEPA that a no-action alternative is addressed in the planning process.

Under alternative A, management activity being conducted by the Service would remain the same. The Service would not develop any new management, research, restoration, education, or visitor services programs at the refuges. Current habitat and wildlife practices benefiting migratory species and other wildlife would not be expanded or changed. No new funding or staff levels would occur and programs would continue to follow the same direction, emphasis, and intensity as they do at present.

Upland Habitat Management

Current uplands habitat management consists of grazing the refuges under special use permit. Wyoming state regulations require landowners to fence-out property to prevent and/or control grazing on their property. The current grazing program (stocking rates, duration, and seasons) would continue until data analysis indicates further management direction.

(Applies to all three Laramie Plains refuges.)

The lack of boundary fencing on the refuge prohibits active management of the grazing program. The adjacent landowner currently holds a special use permit to graze on the refuge. In exchange for issuing the grazing permit, the landowner directs water to refuge grasslands as available.

(Applies only to Bamforth NWR.)

Current uplands habitat management consists of grazing the refuge under special use permit. An evaluation of current upland habitat conditions will assist refuge staff in determining whether grazing will continue to be used as a habitat management tool during the life of the plan.

(Applies only to Hutton Lake NWR.)

Current uplands habitat management consists of grazing the refuge to mimic preacquisition habitat conditions, per Wyoming Toad Recovery Team (Recovery Team) recommendations, under special use permit.

(Applies only to Mortenson Lake NWR.)

Water Rights/Wetland Habitat Management

Currently, very little management of refuge wetlands occurs due to limited water rights considered to be in “poor” standing and the natural hydrology of the refuges. The refuges are located in closed-basin hydrologic systems, which limits Service ability to manage (move, drawdown) water on refuge lands. Refuge staff would continue to use existing water rights to enhance wetlands when water is available.

(Applies to all three Laramie Plains refuges.)

Threatened and Endangered Species

Management for threatened and endangered species would occur if they are discovered on the refuges. At the present time, no known threatened or endangered species use Bamforth NWR or Hutton Lake NWR. Wyoming toads have been released at Hutton Lake NWR, but these releases have not resulted in the establishment of new populations. Refuge staff would continue to facilitate the use of Hutton Lake NWR as a release site for the Wyoming toad, per Recovery Team recommendation.

(Applies only to Bamforth NWR and Hutton Lake NWR.)

Current management priorities at Mortenson Lake NWR focus on implementing the objectives and strategies outlined in the Wyoming Toad Recovery Plan. Until the population recovery goals for the Wyoming toad are met, management priorities would continue to focus on the implementation of Recovery Team objectives.

(Applies only to Mortenson Lake NWR.)

Habitat Protection

No active investigation of land exchanges, purchases, or conservation easements from willing landowners for the benefit of migratory bird species would be pursued.

(Applies to all three Laramie Plains refuges.)

Invasive Species Management

Management of invasive species would continue at present levels with no active monitoring of invasive species occurring, and noxious weed infestations would be treated upon discovery.

(Applies to all three Laramie Plains refuges.)

Tamarisk would continue to be treated under a memorandum of agreement (MOA) with Albany County Weed and Pest.

(Applies only to Hutton Lake NWR.)

Public Use

The refuge is currently closed to public use and is not signed or fenced to mark the refuge boundaries. Until baseline biological information

has been obtained to determine the role the refuge plays in the Refuge System, and whether divestiture of the refuge is warranted, it would not be prudent to invest resources in the development of infrastructure to safely support public use programs.
(Applies only to Bamforth NWR.)

Public use programs would continue at present levels. The refuge would continue to support nonconsumptive wildlife-dependent recreation (i.e., wildlife observation, wildlife photography, environmental education and interpretation) programs. The refuge would remain closed to hunting and fishing.

(Applies only to Hutton Lake NWR.)

The refuge would remain closed to public use. Refuge acquisition documents state that public use programs would not be considered for the refuge until Wyoming toad population recovery goals have been met. At this time, they have not been met.

(Applies only to Mortenson Lake NWR.)

Research and Science

Research activities for habitat and wildlife would remain at current levels. Refuge staff would not conduct research on the refuges. Biological monitoring would continue to be opportunistic in nature and performed mainly by other entities.
(Applies to all three Laramie Plains refuges.)

Biological monitoring for Wyoming toad population recovery would continue to be conducted by the Recovery Team.

(Applies only to Mortenson Lake NWR.)

Cultural Resources

Cultural resources management would continue to consist of protecting known and newly discovered artifacts and sites.

(Applies to all three Laramie Plains refuges.)

Partnerships

Existing refuge partnerships would be maintained, but no new partnerships would be developed or pursued. Refuge staff would continue to work with local landowners to irrigate the refuges when water is available. Refuge staff would continue to work with the board of Laramie-based Albany County Weed and Pest to manage invasive species on the refuges.

(Applies to all three Laramie Plains refuges.)

Refuge staff would continue to work with the Wyoming Audubon Society to explore, develop, and maintain public use opportunities and facilities at the refuge.

(Applies only to Hutton Lake NWR.)

Budget and Staffing

The refuges would continue to be managed by Service staff headquartered at the Arapaho NWR near Walden, Colorado. The refuge staff consists of five full-time employees (FTEs) and three to four seasonal employees. These staff are responsible for management activities on the Arapaho NWR, Bamforth NWR, Hutton Lake NWR, and Mortenson Lake NWR, as well as the Pathfinder NWR, which combined includes 46,673 acres. Refuge staff travel approximately 80 miles to conduct management activities at the Laramie Plains refuges.
(Applies to all three Laramie Plains refuges.)

Alternative B—Enhanced Refuge Management (Proposed Action)

Upland Habitat Management

Continue to use grazing as an upland habitat management tool under special use permit. Install boundary fencing to permit active management of the grazing program.
(Applies only to Bamforth NWR.)

Refuge grazing programs (stocking rates, duration, and seasons) would be evaluated to determine whether grazing would be used as a habitat management tool. Current grazing under special use permit would be discontinued upon the retirement of the current permittee.
(Applies only to Hutton Lake NWR.)

Uplands management would continue to use grazing as a habitat management tool under special use permit. Habitat goals for the grazing program would continue to be directed by the Recovery Team and implemented by refuge staff.
(Applies only to Mortenson Lake NWR.)

Water Rights/Wetland Habitat Management

Wetlands and alkali flats habitat management would focus on utilizing existing water rights to irrigate refuge wetlands when water is available. Refuge staff would research the availability of additional water rights for the refuges and consider obtaining additional water rights, where appropriate, for the benefit of wetland-dependent wildlife.
(Applies to all three Laramie Plains refuges.)

Threatened and Endangered Species

Increased monitoring for presence of threatened and endangered species would occur.
(Applies to all three Laramie Plains refuges.)

Refuge staff would increase efforts to implement Recovery Team recommendations to achieve Wyoming toad population recovery objectives.
(Applies to Mortenson Lake NWR.)

Habitat Protection

When baseline biological information for the refuge has been obtained and evaluated, if the determination is made to retain Bamforth NWR in the Refuge System, refuge staff may investigate potential land tenure changes from willing landowners (e.g., fee title purchase, land exchange, and conservation easement) to acquire contiguous blocks of refuge lands to facilitate management of refuge lands.
(Applies only to Bamforth NWR.)

Refuge staff would investigate potential land tenure changes from willing landowners (e.g., fee title purchase, land exchange, and conservation easement) to provide habitat protection for the benefit of migratory bird species on a large wetland complex that is located adjacent to the west side of the refuge.
(Applies only to Hutton Lake NWR.)

Refuge staff would investigate potential land tenure changes from willing landowners (e.g., fee title purchase, land exchange, and conservation easement) to acquire inholdings within the refuge approved acquisition boundary and buffer areas to provide further protection for the Wyoming toad and other species of conservation concern.
(Applies only to Mortenson Lake NWR.)

Invasive Species

Monitoring and management of invasive species on the refuges would be increased.
(Applies to all three Laramie Plains refuges.)

Public Use

The refuge would remain closed to public use until data analysis indicates further management direction. It would not be considered prudent use of funds to invest Refuge System resources toward the development of infrastructure to support public use programs and later determine the refuge should be divested from the Refuge System.
(Applies only to Bamforth NWR.)

Wildlife observation and wildlife photography programs would be expanded and enhanced. A step-down management plan would be developed to address refuge access, circulation, facility, and infrastructure needs. Efforts to provide environmental education and interpretation on the refuge would be expanded. The refuge would remain closed to hunting and fishing.
(Applies only to Hutton Lake NWR.)

The refuge would remain closed to public use until Wyoming toad population recovery goals have been met. If they are met within the life of the plan, opening the refuge to wildlife-dependent activities would be considered.
(Applies only to Mortenson Lake NWR.)

Research and Science

Research activities for habitat and wildlife would be increased and expanded. Refuge staff would conduct biological monitoring and facilitate researchers and universities to conduct applied research to direct management decisions. Refuge staff would partner with universities and other entities to conduct specific research to identify refuge resources and obtain better understanding of the effects of management activities.

(Applies to all three Laramie Plains refuges.)

The greatest need for Bamforth NWR is to identify the resources of the refuge by obtaining baseline biological information. Data collection would be directed to identifying refuge resources and determining the role these resources serve in the Laramie Plains ecosystem and the Refuge System.

(Applies only to Bamforth NWR.)

Cultural Resources

Cultural resources management would protect known and newly discovered artifacts and sites.

(Applies to all three Laramie Plains refuges.)

Partnerships

Increased emphasis would be placed on maintaining existing partnerships and developing new partnerships to achieve refuge goals and objectives. Efforts would be increased to focus research-based partnerships on collecting baseline data for the refuges.

(Applies to all three Laramie Plains refuges.)

Budget and Staffing

The refuges would continue to be managed by Service staff headquartered at the Arapaho NWR near Walden, Colorado. One additional full-time employee would be hired to perform increased management activities on the three Laramie Plains refuges and Pathfinder NWR.

(Applies to all three Laramie Plains refuges.)

Alternative C—Partnerships

Under alternative C, refuge staff would rely on partnerships to achieve refuge goals and objectives. Refuge management activities would be increased and enhanced through the use of partnerships. Refuge staff would strive to accomplish refuge work through partnerships with others. An emphasis on adaptive management, including monitoring the effects of habitat management practices and using research results to direct ongoing management, would be a priority.

Upland Habitat Management

Uplands management would consist of grazing the refuges under special use permit. Partnerships

would be used to evaluate upland habitat conditions to determine the appropriate grazing program (stocking rates, duration, and seasons) to achieve refuge goals and objectives. Current stocking rates would continue until data analysis indicates further management direction.

(Applies to all three Laramie Plains refuges.)

Refuge staff would work with partners to install boundary fencing on the refuge to permit active management of the grazing program.

(Applies only to Bamforth NWR.)

Refuge staff would work with partners to evaluate habitat conditions to determine whether grazing would continue to be used as a habitat management tool.

(Applies only to Hutton Lake NWR.)

Refuge staff would work with the Recovery Team and partners to evaluate habitat conditions to determine appropriate grazing program to achieve Wyoming toad population recovery goals and refuge goals.

(Applies only to Mortenson Lake NWR.)

Water Rights/Wetlands Habitat Management

Wetlands and alkali flats habitat management would focus on utilizing existing water rights to irrigate refuge wetlands when water is available. Partnerships would be used to research the availability of additional water rights for the refuges.

(Applies to all three Laramie Plains refuges.)

Threatened and Endangered Species

Refuge staff would work with partners to increase monitoring for the presence of threatened and endangered species.

(Applies to all three Laramie Plains refuges.)

Refuge staff would work with partners to increase efforts to implement Recovery Team recommendations to achieve Wyoming toad population recovery objectives.

(Applies only to Mortenson Lake NWR.)

Habitat Protection

When baseline data for the refuge has been obtained and evaluated, if the determination is made to retain Bamforth NWR in the Refuge System, refuge staff would work to use partnerships to investigate potential land tenure changes (e.g., fee title purchase, land exchange, conservation easement) to acquire contiguous blocks of refuge lands to facilitate refuge access to and active management of refuge lands.

(Applies only to Bamforth NWR.)

Refuge staff would use partnerships to investigate potential land tenure changes (e.g., fee title

purchase, land exchange, conservation easement) to provide habitat protection for the benefit of migratory bird species on the large wetland complex adjacent to the refuge.
(Applies only to Hutton Lake NWR.)

Refuge staff would use partnerships to investigate potential land tenure changes (e.g., fee title purchase, land exchange, and conservation easement) to acquire inholdings within the refuge approved acquisition boundary and buffer areas, from willing landowners, to provide further protection for the Wyoming toad and other species of conservation concern.
(Applies only to Mortenson Lake NWR.)

Invasive Species

Refuge staff would develop partnerships to increase the monitoring and management of invasive species on the refuges.
(Applies to all three Laramie Plains refuges.)

Public Use

The refuge would remain closed to public use until data analysis indicates further management direction.
(Applies only to Bamforth NWR.)

Refuge staff would work with partners to enhance wildlife observation and wildlife photography programs and facilities on the refuge. Refuge staff would work with partners to expand efforts to provide environmental education and interpretation on the refuge. The refuge would remain closed to hunting and fishing.
(Applies only to Hutton Lake NWR.)

The refuge would remain closed to public use until Wyoming Toad population recovery goals have been met. If they are met within the life of the plan, opening the refuge to wildlife-dependent activities would be considered.
(Applies only to Mortenson Lake NWR.)

Research and Science

Refuge staff would use partnerships to increase research activities on the refuges. Universities and other entities would conduct specific research to identify refuge resources and obtain a better understanding of the effects of management activities. Applied research would be conducted to direct management decisions.
(Applies to all three Laramie Plains refuges.)

Cultural Resources

Cultural resources management would protect known and newly discovered artifacts and sites.
(Applies to all three Laramie Plains refuges.)

Partnerships

Increased emphasis would be placed on maintaining existing partnerships and developing new partnerships to achieve refuge goals and objectives. Increased efforts would be made to focus research-based partnerships on collecting baseline data for the refuges.
(Applies to all three Laramie Plains refuges.)

Budget and Staffing

The refuges would continue to be managed by Service staff headquartered at the Arapaho NWR near Walden, Colorado. An additional one-half FTE would be assigned to perform increased management of partnership activities on the refuges.
(Applies to all three Laramie Plains refuges.)

3.5 COMPARISON OF ALTERNATIVES AND ENVIRONMENTAL CONSEQUENCES

Table 2 provides descriptions of management actions and environmental consequences by resource and use topics for each of the three alternatives.



Great blue heron.

USFWS

Table 2. Comparison of management alternatives and environmental consequences for the Laramie Plains NWRs, Wyoming.

MANAGEMENT ALTERNATIVES AND ENVIRONMENTAL CONSEQUENCES FOR THE LARAMIE PLAINS REFUGES <i>BAMFORTH NATIONAL WILDLIFE REFUGE HUTTON LAKE NATIONAL WILDLIFE REFUGE MORTENSON LAKE NATIONAL WILDLIFE REFUGE</i>			
<i>Management Categories</i>	Alternative A— Current Management (No Action)	Alternative B— Enhanced Refuge Management (Proposed Action)	Alternative C— Partnerships
Upland Habitat	Management Action		
	<i>Applies to all three Laramie Plains refuges:</i> Continue grazing uplands under special use permit.	<i>Applies to all three Laramie Plains refuges:</i> <ul style="list-style-type: none"> • Monitor and evaluate upland habitat conditions to direct grazing program. • Manage grazing to achieve refuge objectives. • Consider other upland management techniques (prescribed fire, grazing, haying, and mowing). 	<i>Applies to all three Laramie Plains refuges:</i> Same as alternative B, except rely on partners to evaluate upland habitat conditions to direct grazing program.
	Environmental Consequences		
	<i>Applies to all three Laramie Plains refuges:</i> <ul style="list-style-type: none"> • Current upland habitat conditions are maintained. • Continued lack of knowledge regarding grazing impacts to habitat and wildlife. • Other upland management techniques (prescribed fire, grazing, haying, and mowing) not actively pursued. • Native plant abundance and diversity would continue to decline. • Introduced cool-season grasses would continue to gradually increase. <i>Applies to Bamforth NWR: Uncontrolled</i>	<i>Applies to all three Laramie Plains refuges:</i> <ul style="list-style-type: none"> • Evaluation of upland habitat conditions results in data to determine appropriate grazing program (stocking rates, duration, timing) and guide management decisions. • Grazing program evaluation guides grazing. • Apply additional upland management techniques (prescribed fire, grazing, haying, and mowing). • Fire and grazing disturbances would approximate historical frequency, timing, and intensity. Associated nutrient cycles would largely 	<i>Applies to all three Laramie Plains refuges:</i> Same as alternative B, except success in achieving refuge objectives dependent on viable partnerships.

Management Categories	Alternative A— Current Management (No Action)	Alternative B— Enhanced Refuge Management (Proposed Action)	Alternative C— Partnerships
	grazing continues due to lack of fencing with adjacent neighbors.	be restored. <ul style="list-style-type: none"> • The relatively arid soil surface environment would be less hospitable to introduced plant species. • The plant community would become increasingly dominated by native herbaceous species. • The diversity and abundance of species that use grassland would increase. 	
Wetlands and Alkali Flats Habitat	Management Action		
	<i>Applies to all three Laramie Plains refuges:</i> <ul style="list-style-type: none"> • Limited staff, restricted water rights, and natural hydrology (closed basin) impede managed drawdown of wetlands. 	<i>Applies to all three Laramie Plains refuges:</i> <ul style="list-style-type: none"> • Same as A, plus increased efforts to monitor and manage refuge wetlands. • Consider other wetland-management tools (prescribed fire, grazing, haying, and mowing). 	<i>Applies to all three Laramie Plains refuges:</i> Same as alternative B, except rely on partners to conduct increased monitoring and management of wetlands.
	Environmental Consequences		
<i>Applies to all three Laramie Plains refuges:</i> <ul style="list-style-type: none"> • Wetland habitats continue to be dependent on natural processes resulting in little movement of water between impoundments. • Many wetland units would lack capacity to provide the full spectrum of wetland conditions, including dry marsh, densely vegetated marsh (regenerative phase), hemi-marsh, open marsh (degenerative phase), and open water. • Wetland soils would be infrequently oxidized, resulting in the rare germination of important annual plants that provide food sources for 	<i>Applies to all three Laramie Plains refuges:</i> <ul style="list-style-type: none"> • The capacity to provide the full spectrum of wetland conditions would increase. All phases would be represented, including dry marsh, densely vegetated marsh (regenerative phase), hemi-marsh, open marsh (degenerative phase), and open water. • Wildlife diversity would increase with more diverse wetland conditions. 	<i>Applies to all three Laramie Plains refuges:</i> Same as alternative B, except dependent on viable partnerships.	

Management Categories	Alternative A— Current Management (No Action)	Alternative B— Enhanced Refuge Management (Proposed Action)	Alternative C— Partnerships
	wetland-dependent migratory birds.		
Water Rights	Management Action		
	<i>Applies to all three Laramie Plains refuges:</i> Continue to use existing water rights to enhance grassland and wetlands habitats when water is available. <i>Applies to Mortenson Lake NWR:</i> Continue limited monitoring of water quality.	<i>Applies to all three Laramie Plains refuges:</i> Same as A, plus research availability of additional water rights and consider obtaining them where available to improve refuge habitats. <i>Applies to Mortenson Lake NWR:</i> Increase water quality monitoring.	<i>Applies to all three Laramie Plains refuges:</i> Same as alternative B, except rely on partners to research availability of additional water rights. <i>Applies to Mortenson Lake NWR:</i> Rely on partners to conduct water quality monitoring.
	Environmental Consequences		
	<i>Applies to all three Laramie Plains refuges:</i> Wetland conditions and wildlife habitat will be dependent on existing minimal water rights, resulting in minimal ability to accomplish managed drawdown of wetland habitats. <i>Applies to Mortenson Lake NWR:</i> Minimal knowledge of refuge water quality and impacts on the Wyoming toad.	<i>Applies to all three Laramie Plains refuges:</i> Refuge habitats could be improved with acquisition of additional water rights resulting in <ul style="list-style-type: none"> increased irrigation of refuge meadows and uplands; potentially less alkalinity in refuge wetlands; active management of water levels in wetlands. Increased capacity to provide the full spectrum of wetland conditions. <i>Applies to Mortenson Lake NWR:</i> Increased knowledge of refuge water quality and impacts on the Wyoming toad and other wildlife.	<i>Applies to all three Laramie Plains refuges:</i> Same as alternative B, except success in achieving refuge objectives dependent on viable partnerships.
Threatened and Endangered Species	Management Action		
	<i>Applies to Mortenson Lake NWR:</i> Continue to coordinate with Wyoming Toad Recovery Team on Wyoming toad population recovery efforts.	<i>Applies to Mortenson Lake NWR:</i> Enhance Wyoming toad management efforts.	<i>Applies to Mortenson Lake NWR:</i> Same as alternative B, except rely on partnerships to enhance management efforts.
	Environmental Consequences		
	<i>Applies to Mortenson Lake NWR:</i> Continued efforts for Wyoming toad recovery.	<i>Applies to Mortenson Lake NWR:</i> Population recovery goals achieved quicker.	<i>Applies to Mortenson Lake NWR:</i> Same as alternative B, except dependent on viable partnerships.

Management Categories	Alternative A— Current Management (No Action)	Alternative B— Enhanced Refuge Management (Proposed Action)	Alternative C— Partnerships
Habitat Protection	Management Action		
	<p><i>Applies to Hutton Lake NWR:</i> No active investigation of long-term protection of large wetland complex adjacent to the refuge.</p> <p><i>Applies to Mortenson Lake NWR:</i> No investigation of acquiring buffer zones for protection of Wyoming toad.</p>	<p><i>Applies to Hutton Lake NWR:</i> Investigate willing landowner opportunity for long-term protection (fee title purchase, easement) of large wetland complex adjacent to the refuge.</p> <p><i>Applies to Mortenson Lake NWR:</i> Investigate acquiring buffer zones from willing sellers for protection of Wyoming toad.</p>	<p><i>Applies to Hutton Lake NWR:</i> Same as alternative B, except rely on partnerships to investigate willing landowner opportunity for long-term protection of large wetland complex adjacent to the refuge.</p> <p><i>Applies to Mortenson Lake NWR:</i> Rely on partners to investigate potential availability of buffer zones from willing sellers for protection of Wyoming toad.</p>
	Environmental Consequences		
	<p><i>Applies to Hutton Lake NWR:</i> Lost opportunity to protect wetland complex adjacent to the refuge.</p> <p><i>Applies to Mortenson Lake NWR:</i> Lost opportunity to increase habitat protection for Wyoming toad.</p>	<p><i>Applies to Hutton Lake NWR:</i> Long-term protection of wetland complex provides increased nesting and foraging areas for waterfowl and other migratory birds.</p> <p><i>Applies to Mortenson Lake NWR:</i> Buffer zones provide increased habitat protection for Wyoming toad.</p>	<p><i>Applies to Hutton Lake NWR:</i> Same as alternative B, except dependent on viable partnerships.</p> <p><i>Applies to Mortenson Lake NWR:</i> Same as alternative B, except dependent on viable partnerships.</p>
Invasive Species	Management Action		
	<p><i>Applies to all three Laramie Plains refuges:</i> Continue to manage for invasive species in accordance with state law and Service policy.</p> <p><i>Applies to Bamforth NWR and Mortenson Lake NWR:</i> Currently no known infestations.</p> <p><i>Applies to Hutton Lake NWR:</i> Tamarisk treated under MOA by Albany County Weed and Pest.</p>	<p><i>Applies to all three Laramie Plains refuges:</i> Increase monitoring and management of invasive species.</p>	<p><i>Applies to all three Laramie Plains refuges:</i> Same as alternative B, except rely on partners to conduct increased monitoring and management of invasive species.</p>
	Environmental Consequences		
	<p><i>Applies to all three Laramie Plains refuges:</i> Management of invasive species continues to be reactionary (occurring when problems are identified).</p>	<p><i>Applies to all three Laramie Plains refuges:</i> With increased monitoring of invasive species, management becomes proactive.</p>	<p><i>Applies to all three Laramie Plains refuges:</i> Same as alternative B, except dependent on viable partnerships.</p>

Management Categories	Alternative A— Current Management (No Action)	Alternative B— Enhanced Refuge Management (Proposed Action)	Alternative C— Partnerships
Public Use	Management Action		
	<p><i>Applies to all three Laramie Plains refuges:</i> Refuge remains closed to hunting and fishing.</p> <p><i>Applies to Hutton Lake NWR:</i></p> <ul style="list-style-type: none"> • Provide self-directed opportunities for wildlife observation and wildlife photography. • Support refuge use by school groups for environmental education purposes. • Conduct interpretive talks upon request, when available. 	<p><i>Applies to all three Laramie Plains refuges:</i> Same as alternative A.</p> <p><i>Applies to Hutton Lake NWR:</i> Increase wildlife observation, wildlife photography, environmental education, and interpretive programs and facilities.</p>	<p><i>Applies to all three Laramie Plains refuges:</i> Same as alternative A.</p> <p><i>Applies to Hutton Lake NWR:</i> Same as alternative B, except rely on partners to increase wildlife observation, wildlife photography, environmental education, and interpretive programs and facilities.</p>
	Environmental Consequences		
	<p><i>Applies to all three Laramie Plains refuges:</i></p> <ul style="list-style-type: none"> • Hunting and fishing occur on other public lands in the area. • Minimize disturbance to wildlife and habitat. <p><i>Applies to Hutton Lake NWR:</i></p> <ul style="list-style-type: none"> • Public continues self-directed wildlife observation and photography. • Lack of regulatory information (signage, brochure) increases potential for negative habitat impacts due to uncontrolled access. • Minimal educational and interpretive opportunities for Laramie community. 	<p><i>Applies to all three Laramie Plains refuges:</i> Same as alternative A.</p> <p><i>Applies to Hutton Lake NWR:</i></p> <ul style="list-style-type: none"> • Enhanced opportunities for wildlife observation and wildlife photography. • Increased public awareness of natural resource ecology and refuge management. 	<p><i>Applies to all three Laramie Plains refuges:</i> Same as alternative A.</p> <p><i>Applies to Hutton Lake NWR:</i> Same as alternative B, except success dependent on viable partnerships.</p>
Research and Science	Management Action		
	<p><i>Applies to all three Laramie Plains refuges:</i> Continue opportunistic biological monitoring under special use permit with efforts limited to sporadic inventories of vegetation composition.</p> <p><i>Applies to Hutton Lake</i></p>	<p><i>Applies to all three Laramie Plains refuges:</i> Service conducts applied research to guide management decisions.</p> <p><i>Applies to Bamforth NWR:</i> Service gathers baseline biological information to determine refuge resources.</p>	<p><i>Applies to all three Laramie Plains refuges:</i> Rely on partners to conduct applied research that would be used to guide management decisions.</p>

Management Categories	Alternative A— Current Management (No Action)	Alternative B— Enhanced Refuge Management (Proposed Action)	Alternative C— Partnerships
	<p><i>NWR:</i></p> <ul style="list-style-type: none"> • WGF performs annual colonial waterbird and goose breeding surveys. • Maintain traffic counter. <p><i>Applies to Mortenson Lake NWR:</i> Recovery Team continues to conduct biological monitoring for Wyoming toad population recovery.</p>	<p><i>Applies to Hutton Lake NWR:</i> Analyze traffic data to obtain better understanding of public use patterns and needs.</p> <p><i>Applies to Mortenson Lake NWR:</i> Service conducts increased monitoring and research to benefit migratory birds and other wildlife on the refuge.</p>	
Environmental Consequences			
	<ul style="list-style-type: none"> • <i>Applies to Bamforth NWR:</i> Refuge staff has little ability to implement science-based management or defend management actions. 	<p><i>Applies to all three Laramie Plains refuges:</i></p> <ul style="list-style-type: none"> • Knowledge of refuge resources enhanced through biological monitoring. • Data analysis guides management actions. 	<p><i>Applies to all three Laramie Plains refuges:</i> Same as alternative B, except dependent on viable partnerships.</p>
Cultural Resources	Management Action		
	<p><i>Applies to all three Laramie Plains refuges:</i></p> <ul style="list-style-type: none"> • Continue to protect cultural resources in accordance with federal and state laws, policies, and guidelines. • Regional archeologist is consulted during the planning phase of proposed projects and determines the need for an archeological site clearance from the Wyoming State Historic Preservation Office. 	<p><i>Applies to all three Laramie Plains refuges:</i> Same as alternative A, plus consider cultural resources site survey.</p> <p><i>Applies to Hutton Lake NWR:</i> Where appropriate, interpret cultural resources to educate the staff, community, and visitors about the area's past.</p>	<p><i>Applies to all three Laramie Plains refuges:</i> Same as alternative B, except rely on partners to conduct cultural resources site survey.</p> <p><i>Applies to Hutton Lake NWR:</i> Where appropriate, rely on partners to interpret cultural resources to educate staff, community, and visitors about the area's past.</p>
	Environmental Consequences		
Partnerships	Management Action		
	<p><i>Applies to all three Laramie Plains refuges:</i></p> <ul style="list-style-type: none"> • Continue to work with local landowner to manage refuge 	<p><i>Applies to all three Laramie Plains refuges:</i> Same as alternative A, plus expand efforts to develop, coordinate, and</p>	<p><i>Applies to all three Laramie Plains refuges:</i> Same as alternative B, except rely on partnerships to achieve refuge goals.</p>

Management Categories	Alternative A— Current Management (No Action)	Alternative B— Enhanced Refuge Management (Proposed Action)	Alternative C— Partnerships
	<p>water when available.</p> <ul style="list-style-type: none"> Continue to work with the board of Albany County Weed and Pest to manage invasive species on the refuge. <p><i>Applies to Mortenson Lake NWR:</i></p> <ul style="list-style-type: none"> Continue partnership with Recovery Team to achieve Wyoming toad population recovery goals. Continue partnership with local landowner to graze the refuge to provide desired habitat condition for Wyoming Toad. 	<p>manage new partnerships to benefit the refuge.</p>	
Environmental Consequences			
	<p><i>Applies to all three Laramie Plains refuges:</i></p> <ul style="list-style-type: none"> Refuge continues to use water rights and receive water when available. Survey and control of invasive species on the refuges continues. 	<p><i>Applies to all three Laramie Plains refuges:</i> Partnerships augment refuge staff ability to understand and manage refuge resources.</p>	<p><i>Applies to all three Laramie Plains refuges:</i> Same as alternative B, except dependent on viable partnerships.</p>
Refuge Operations	Management Action		
	<p><i>Applies to all three Laramie Plains refuges:</i></p> <ul style="list-style-type: none"> Retain current staffing of 5 FTE employees. Continue refuge administration by Service staff headquartered at Arapaho NWR near Walden, Colorado. Continue the current level of funding to support refuge operations and maintenance. 	<p><i>Applies to all three Laramie Plains refuges:</i></p> <ul style="list-style-type: none"> Hire one additional FTE and assign to the Laramie Plains refuges and Pathfinder NWR to perform increased management activities. Increase funding to support baseline data collection efforts. Service performs year-round field work and planning on the refuges. 	<p><i>Applies to all three Laramie Plains refuges:</i></p> <ul style="list-style-type: none"> Assign ½ FTE to the Laramie Plains refuges to develop and manage partnerships. Increase funding to support the development and management of partnerships to achieve refuge goals. Rely on partners to conduct field work on the refuges.
Environmental Consequences			
	<p><i>Applies to all three Laramie Plains refuges:</i></p> <ul style="list-style-type: none"> Management activities conducted on the refuges remain minimal. 	<p><i>Applies to all three Laramie Plains refuges:</i> Increased opportunity to manage refuge resources.</p>	<p><i>Applies to all three Laramie Plains refuges:</i> Same as alternative B, except success dependent on viable partnerships.</p>

4 Affected Environment

Located in northern Wyoming in a high plains basin ecosystem known as the Laramie Basin, the Laramie Plains refuges lie near the center of the Mountain–Prairie Region. Bamforth NWR, Hutton Lake NWR, and Mortenson Lake NWR support wetland complexes that provide resting, nesting, and breeding areas for migratory birds in a semiarid environment. In addition, Mortenson Lake NWR provides habitat for the endangered Wyoming toad.

This chapter describes the refuges’ setting, as follows:

- physical environment
- biological resources
- cultural resources
- special management areas
- visitor services
- socioeconomic environment
- operations

4.1 PHYSICAL ENVIRONMENT

Global Warming

The U.S. Department of the Interior issued an order in January 2001 requiring federal agencies under its direction that have land management responsibilities to consider potential climate change effects as part of long-range planning endeavors.

The Department of Energy’s report, “Carbon Sequestration Research and Development,” concluded that ecosystem protection is important to carbon sequestration and may reduce or prevent loss of carbon currently stored in the terrestrial biosphere. The report defines carbon sequestration as “the capture and secure storage of carbon that would otherwise be emitted to or remain in the atmosphere.”

The increase of carbon dioxide (CO₂) within the earth’s atmosphere has been linked to the gradual rise in surface temperature commonly referred to as “global warming.” In relation to comprehensive conservation planning for Refuge System units, carbon sequestration constitutes the primary climate-related effect to be considered in planning.

Vegetated land is an important factor in carbon sequestration. Large, naturally occurring

communities of plants and animals that occupy major habitats—grasslands, forests, wetlands, tundra, and desert—are effective both in preventing carbon emission and in acting as biological “scrubbers” of atmospheric CO₂.

One service activity in particular—prescribed burning—releases CO₂ directly to the atmosphere from the biomass consumed during combustion yet results in no net loss of carbon because new vegetation quickly germinates and sprouts to replace the burned-up biomass. This vegetation sequesters an approximately equal amount of carbon as was lost to the air (Dai et al. 2006). Several other effects of climate change may need to be considered in the future:

- Habitat available in lakes and streams for cold-water fish such as trout and salmon could be reduced.
- Forests may change, with some plant species shifting their range northward or dying out and other trees moving in to take their place.
- Ducks and other waterfowl could lose breeding habitat because of stronger and more frequent droughts.
- Changes in the timing of migration and nesting could put some birds out of synchronization with the life cycles of their prey.

Climate

The Laramie Basin is considered a cold desert with annual precipitation averaging 11.53 inches (High Plains Regional Climate Center 2006). The average maximum temperature is 53.8°F, average minimum temperature is 26.8°F, and extremes range from a summer high of 95°F to a record low of –50°F. The area is known for persistent windy conditions, and the growing season is short, typically from late May to early September (U.S. Department of Agriculture [USDA] 1998).

Physiography, Geography, and Soils

The current physiography of the Laramie Plains was influenced by a shallow warm water sea, a crustal uplift affecting Colorado and southeast Wyoming, the Laramide Orogeny Mountain building episode, volcanic activity in the Yellowstone area, and influences of the ice ages. Most of the stable

landforms in the area today were created within the last hundred thousand years by glacial outwash waters. Many of the soils therefore have alluvial origins (USDA 1998). The high, flat nature of much of Wyoming is conducive to strong winds, and several features on the land suggest that wind has played an important role in past geological development as well. Data suggest that the Laramie Basin—including Bamforth NWR—is a deflation hollow formed by wind action (Morrison 1991). Bamforth Lake NWR is at about 7,000 feet in elevation with the benches reaching over 7,200 feet. Hutton Lake NWR and Mortenson Lake NWR lie between 7,200 feet and 7,300 feet.

Land Use

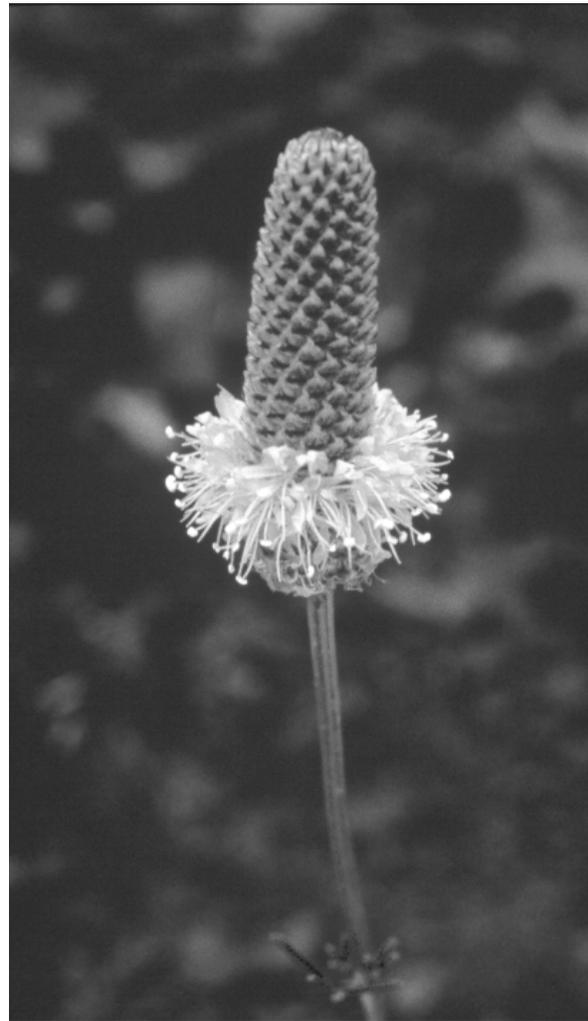
A large percentage of the Wyoming Basin (*see* figure 2) is in public ownership, with the Bureau of Land Management (BLM) owning much of the lower elevation shrub-steppe and grassland and the U.S. Forest Service owning a great deal of the higher-elevation wooded land. A checkerboard pattern of land ownership is a subtle problem that affects the consistency of land management over large areas. The primary land use in the Wyoming Basin has been for many years and continues to be grazing, although conversion to agriculture is also an issue. The effects of overgrazing and nonnative plant invasion should be mitigated to improve conditions for breeding birds. Maintenance of springs and riparian habitat may be crucial, particularly to sage grouse. Fencing or changing grazing systems may be effective in maintaining water flow. Oil and gas extraction and hard rock mining are relatively recent factors that may negatively affect the greater landscape needs of the sage-grouse. .

Water Resources

This section describes the hydrology and water rights of the Laramie Plains refuges.

Hydrology

The Laramie River is the primary water source for the county. With its headwaters beginning in the Rawah Mountains to the south in Colorado, as well as the Laramie Mountains to the east and Medicine Bow Mountains to the west, the river winds a course from south to north through Albany County, exits to the northeast and ultimately empties into the North Platte River near Wheatland, Wyoming (USDA 1998).



Purple prairie clover

USFWS

Water Rights

Water rights for the Laramie Plains refuges are listed in table 3.

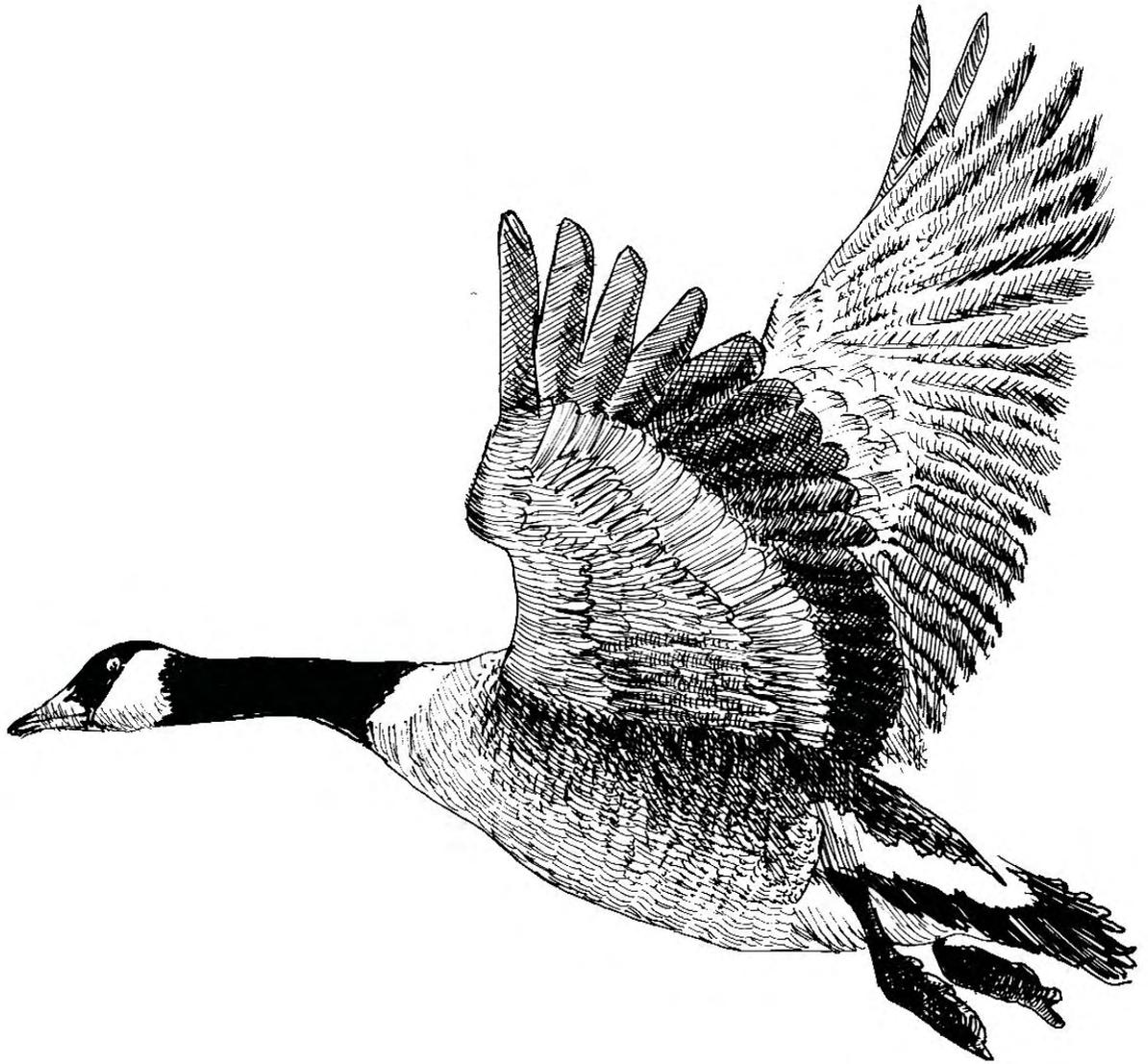
Air Quality

Air quality receives protection under several provisions of the Clean Air Act, including the national ambient air quality standards (NAAQS) and the prevention of significant deterioration program. NAAQS include maximum allowable pollution levels for particulate matter, ozone, sulfur dioxide, nitrogen dioxide, lead, and carbon dioxide.

Based on Wyoming's most current data, the state has relatively clean air. In the area of the refuges (Albany County), the levels of carbon monoxide, nitrogen dioxide, ozone, sulfur dioxide, particulate matter (diameter <2.5 micrometers), particulate matter (diameter <10 micrometers), and lead did not exceed federal standards at any monitoring site in 2006 ([U.S. Environmental Protection Agency] 2007a).

Table 3. Water rights for Laramie Plains refuges, Wyoming.

<i>Permit No.</i>	<i>Territorial Proof No.</i>	<i>Priority No.</i>	<i>Priority Date</i>	<i>County</i>	<i>Station</i>	<i>Name</i>	<i>Use</i>	<i>Source</i>	<i>CFS Rate</i>	<i>GPM Rate</i>	<i>Storage Acre-Feet</i>	<i>Additional Information</i>
20132			7/3/1947	Albany	Mortenson Lake NWR	Harman Ditch	Irrigation & Stock	Richard Draw	1.1			Direct flow. Unadjudicated.
20459			7/13/1949	Albany	Mortenson Lake NWR	Soda Lake Ditch	Irrigation, Domestic & Stock	Soda Lake Draw	2.29			Supplemental to 4/19/1879 right from Laramie River thru Pioneer Canal & secondary from 5617 res.
7259			4/14/1967	Albany	Mortenson Lake NWR	Mortenson Lake	Irrigation	Meeboer Draw			247.46	Seepage (Mortenson Lake Reservoir storage water not attached to specific lands).



The air quality index (AQI) is an approximate indicator of overall air quality, because it takes into account all of the criteria air pollutants measured within a geographic area. Air quality in Albany County is considered to be generally good, with no reported days of unhealthy air quality (EPA 2007b).

Prescribed burning is the refuge management activity that has the greatest effect on air quality (find more information in the description of the fire management program in appendix E). The management of smoke is incorporated into planning prescribed burns and, to the extent possible, in suppression of wildfires. Sensitive areas are identified and precautions are taken to safeguard visitors and local residents. Smoke dispersal is a consideration in determining whether a prescribed burn is within prescription. Generally, the fine-grass fuels and small burn size (80–600 acres) generate low volumes of smoke for short durations (4–5 hours).

4.2 BIOLOGICAL RESOURCES

This section describes vegetation, wildlife, and their associated communities at the Laramie Plains refuges. Appendices F–I list species that can be found on the refuges for plants (appendix F), birds (appendix G), amphibians and reptiles (appendix H), and mammals (appendix I).

Habitat

Major habitat types of the Laramie Plains refuges include open water wetlands, uplands consisting of brush and grasslands, alkali flats, and irrigated meadows. The location and distribution of the major habitat types for the refuges are shown in the habitat maps for Bamforth NWR (figure 8), Hutton Lake NWR (figure 9), and Mortenson Lake NWR (figure 10).

Open Water Wetlands

The wetlands within the Laramie Plains refuges vary from natural basins to constructed impoundments and enhanced basins. The physical look of the refuges wetlands ranges from complete open water to rimmed with emergent vegetation to dominated by emergents. Natural runoff somewhat influences these areas, but most water added to these wetlands comes from water rights from irrigation ditches adjudicated through the state of Wyoming. The ability to manage waters in the different impoundments varies considerably.

In Albany County's semiarid environment, the natural and enhanced lakes and ponds on the refuges, as well as the other impoundments, are tightly regulated by the Wyoming State Engineer's Office. Prior to European settlement of Wyoming

in the nineteenth century, the Laramie Plains lakes were playas, filling in high runoff years and drying up completely during sustained droughts. Although there are several streams in the county, most of the lakes are independent of their influence from flooding. Following settlement, a series of irrigation ditches were constructed to provide flood irrigation waters for hay and crop production. These ditches probably aided in maintaining more reliable water levels for some of the plains lakes, as return irrigation flows were captured in them, and some of the basins were developed to serve as storage reservoirs for irrigation.

The lower-priority irrigation rights owned by the Service for the refuges often result in little or no irrigation water reaching refuge impoundments, which potentially mimics natural historic conditions, as the wetlands receive more water in good water years and little to no water in drought years. However, good snowpacks in the mountains can result in higher water availability in the irrigation system being available for the Laramie Plains lakes, a condition that may not have obtained in presettlement days. Wildlife is considered a viable water use category under Wyoming water law and is covered under either the irrigation or miscellaneous use categories.

Wetlands of Bamforth NWR

Records indicate Bamforth NWR has received little to no active wetlands management since its establishment in 1932. Bamforth NWR is located in a 4,000-acre natural depression known as the Big Basin northwest of Laramie. The bottom of the basin is dominated by alkali flats, small ponds, and Bamforth Lake, which encompasses approximately 250 acres when full. Bamforth Lake is owned mostly by the state of Wyoming with approximately 100 acres of the 550-acre lake located in the refuge boundary. The lake comprises half of the refuge, while the other half is upland habitat.

The Park ditch flows through the southwest portion of the refuge, and the Alsop ditch No. 1 flows along the northwest portion of the Big Basin. The refuge owns very junior irrigation water rights out of the Park ditch only, but water use in both ditches potentially influences refuge wetlands through irrigation return flows and subsurface water effects. Two small dikes are located on refuge lands—one is a stock watering pond, and the other is used for stock and irrigation storage, with most of the storage area located off refuge property. The ponds in the bottom of the basin are natural, with no inlet or outlet structures, resulting in little to no management capabilities. The soils along the bottom of the basin, including the ponds when dry, are strongly saline, resulting in minimal emergent or submergent vegetative growth. An island in Bamforth Lake, but not on refuge property, is used by white pelicans,

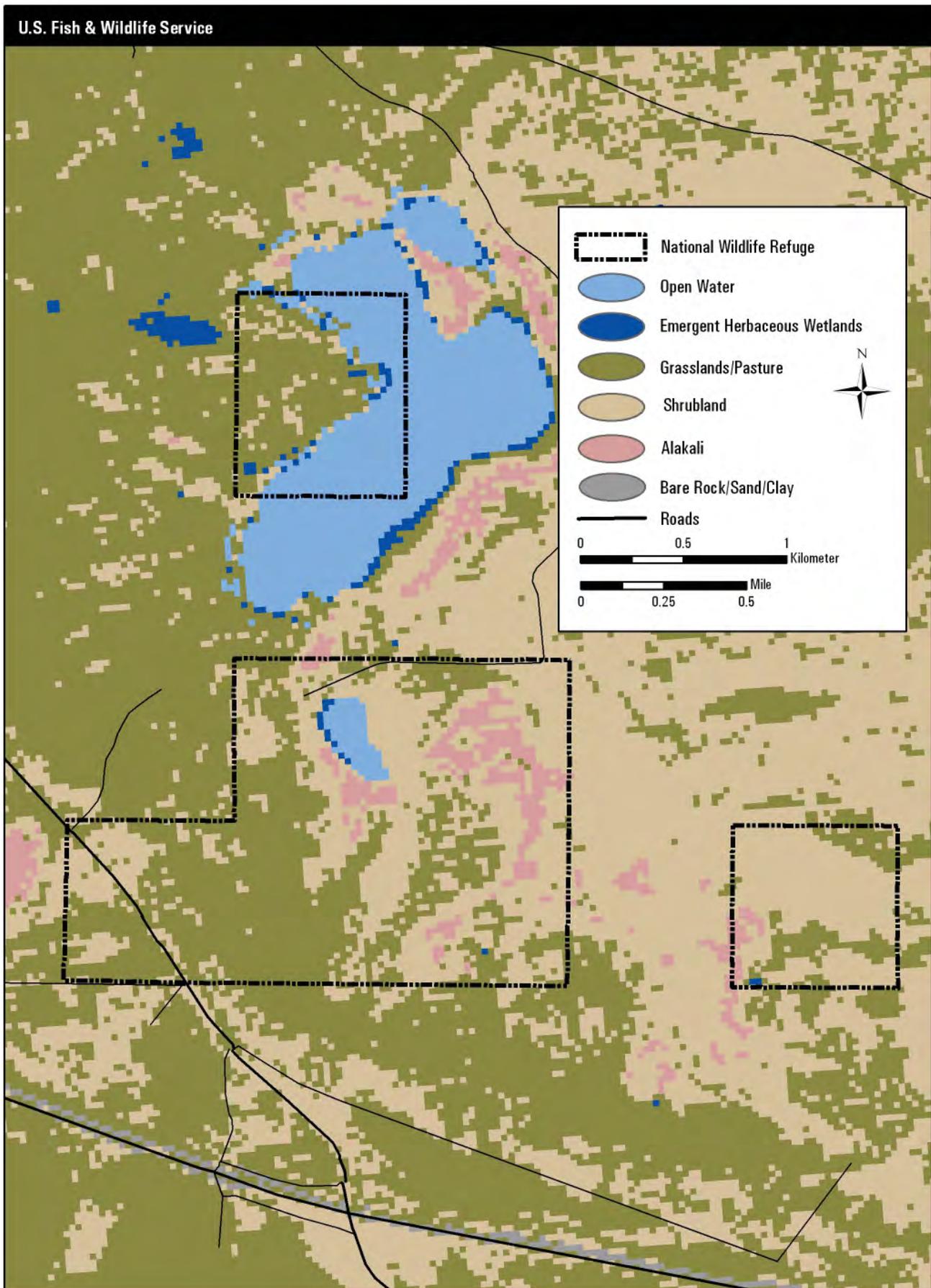


Figure 8. Habitats at Bamforth NWR, Wyoming.

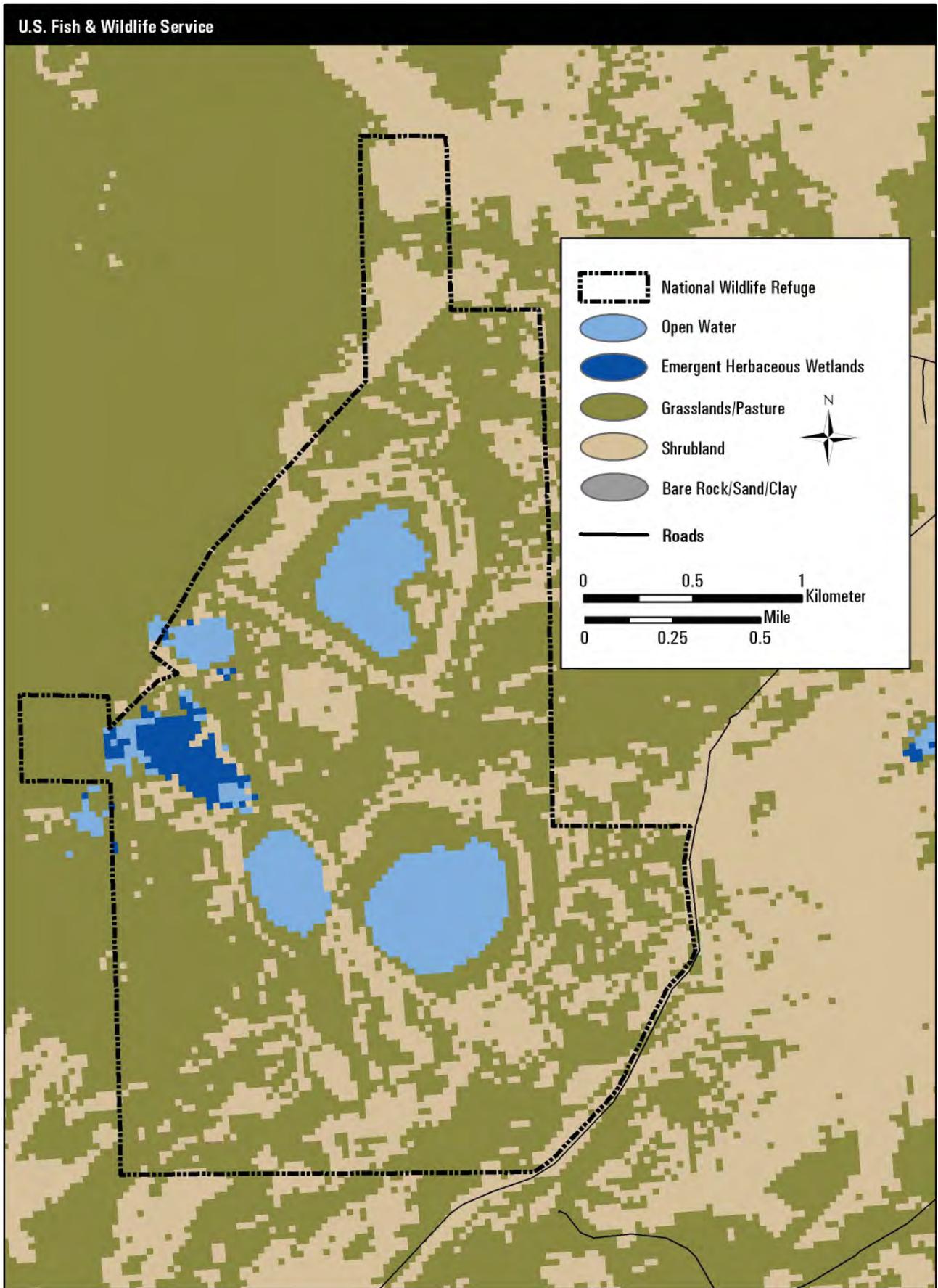


Figure 9. Habitats at Hutton Lake NWR, Wyoming.

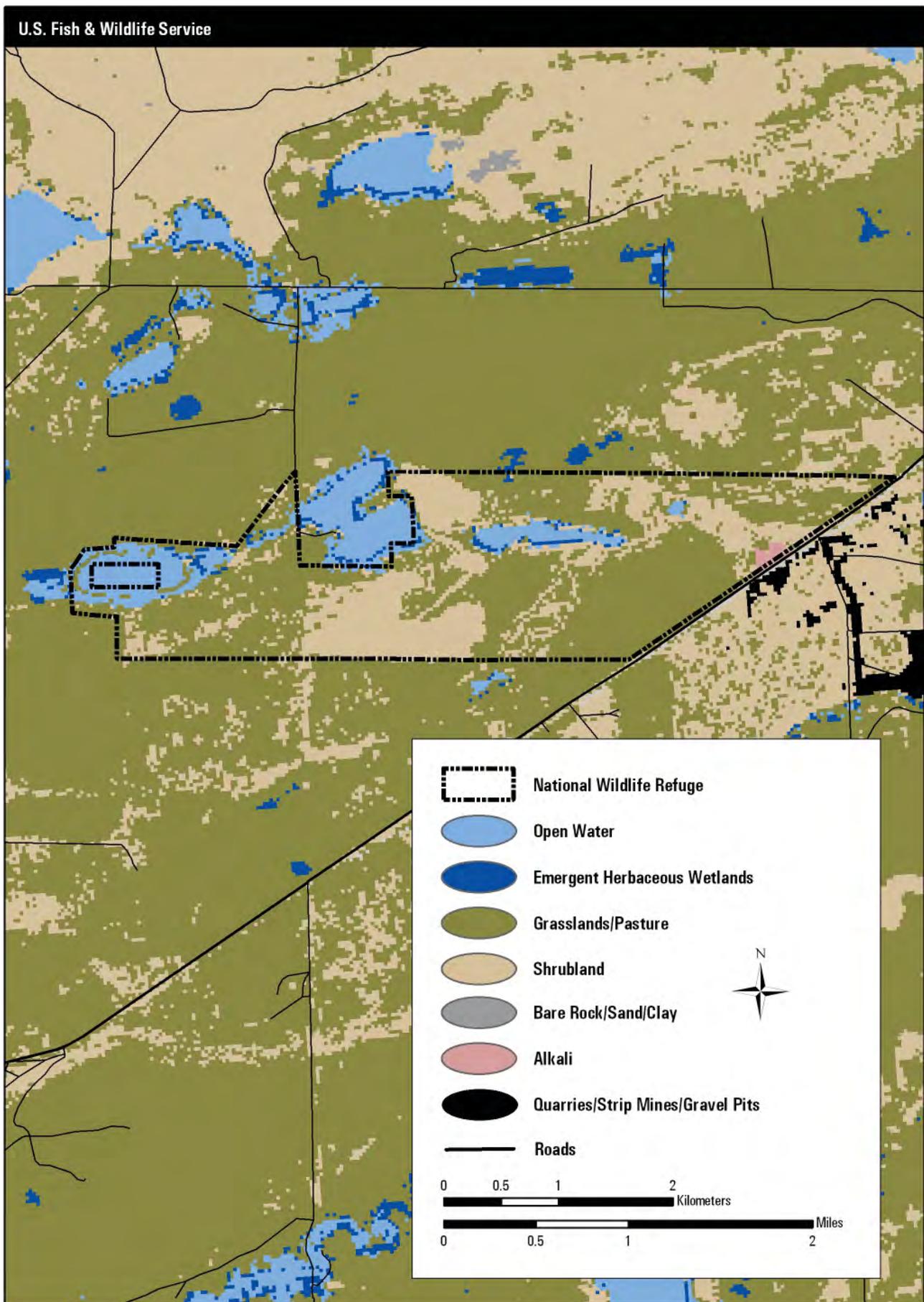


Figure 10. Habitats at Mortenson Lake NWR, Wyoming.

double-crested cormorants, and California gulls for nesting. The area is also used by American avocets and killdeer, and occasionally by other migrating shorebirds and waterfowl.

Remaining refuge habitats include greasewood-dominated upland, alkali flats, and a limited amount of grassland. Before 1950, Bamforth Lake was an important area for many wildlife species due to a fairly dependable water supply. With the full development of the Wheatland Irrigation District, however, Bamforth Lake lost its major water supply due to junior refuge water rights (USFWS 1980). The loss of water for the refuge minimized the importance of Bamforth NWR from the mid-1950s to present day.

Wetlands of Hutton Lake NWR

Hutton Lake NWR consists of five impoundments and surrounding uplands immediately adjacent to the floodplain of the Laramie River southwest of Laramie. Originally, there were likely only three separate basins—what is now Creighton Lake, Lake George, and Hutton Lake. Dikes were constructed to create Rush and Hoge lakes and along the west boundary of the refuge in an apparent attempt to keep water from reaching the floodplain to the west. A diversion structure was also placed in Sand Creek to move appropriated water from the creek to the refuge, and ditches were dug to connect Rush and Creighton lakes and Lake George for easier water movement between them.

Creighton Lake (210 surface acres or 2,525 acre-feet) and Hutton Lake (221 surface acres or 1,135 acre-feet) are large and fairly deep open water areas with no water management capabilities once water reaches them. They typically fluctuate between various water levels based on yearly water availability and evaporation, rarely being completely full or dry. The fluctuating water levels prevent the establishment of emergent vegetation on these two wetlands by either drying up or flooding out any plants that might try to take hold.

Lake George is a smaller natural basin (16 surface acres or 250 acre-feet), and receives water more often and more reliably than the larger pools. It maintains a water level stable enough for the establishment of a hardstem bulrush ring that completely encircles the lake.

Rush and Hoge lakes are larger than Lake George, but shallower and smaller than Hutton and Creighton lakes. Rush Lake (95 surface acres or 250 acre-feet) is the first in the system to receive water, so it generally benefits from available water from Sand Creek. It is also the shallowest pool and tends to dry up the quickest when water ceases to be available for recharge. Over 50 percent of Rush lake is emergent vegetation—hardstem bulrush and cattail—with numerous smaller areas of open

water, and historic ditches through the lake to aid water movement to Hoge Lake and Lake George. Hoge Lake (75 surface acres or 200 acre-feet) has open water through its middle with significant stands of hardstem bulrush along the dike between it and Rush Lake and in the bay on its south side. Submergent vegetation is found in all pools but not in large amounts.

Creighton and Hutton lakes are important resting areas for waterfowl in the spring and fall, as rafts of redheads, scaup, canvasback, and coots numbering in the thousands are not uncommon. Canada geese use these lakes as molting areas in the summer. George Lake and Hoge and Rush lakes provide nesting habitat for coots, ruddy ducks, blackbirds, marsh wrens, pied-billed grebes, and soras, as well as feeding habitat for coots and dabbling ducks. Rush Lake also provides nesting habitat for white-faced ibis and black-crowned night-herons. Water levels are generally low enough on Creighton and Hutton lakes to allow nesting by American avocets and killdeer, but the lakes can potentially flood in high-water years.

During the summers of 2004 and 2005, California gull and double-crested cormorant rookery were established along the north shore of Hutton Lake. This activity had not been previously observed and is below the high waterline of the lake, so whether nesting would continue under high water conditions is yet to be determined.

From the time of its settlement to current day, the lack of good water rights for Hutton Lake NWR is a constant theme. In the arid Laramie plains, water is a key resource in managing habitat for the benefit of migratory bird species. Because the Service does not own senior water rights, refuge wetlands water levels are dependent on natural processes and the willingness of adjoining landowners holding watering rights in Sand Creek to share their rights.

Records from the 1970s indicate low water availability and difficulty in providing water to refuge wetlands due to minimal water rights for the refuge. This trend of low water is prevalent through the 1970s until 1979 and 1980, which were reportedly good water years. By 1981 water conditions were again reported as poor.

Since the 1980s, water control structures at the refuge have remained in place with no manipulation of the boards or screw gates to actively manage water levels (Pam Johnson, wildlife biologist, Arapaho NWR; personal communication, January 2007). Water levels must be high in Rush and Hoge lakes and Lake George before water can move to the other wetlands. A water diversion structure on Sand Creek is opened or closed as needed by the Wyoming water commissioner. From Rush Lake water can flow to Lake George or Hoge Lake, or both. Lake George connects to the largest lake

(Creighton Lake) and Hoge Lake connects to Hutton Lake (see figure 11).

Wetlands of Mortenson Lake NWR

Mortenson Lake NWR wetlands consist of four lakes positioned in a west to east line sharing what can be a common water source, an alkali playa, and an irrigation-dependent impoundment known as Harmon Reservoir. The current string of lakes was likely three playas prior to settlement. Springs to the south and west of the area, if natural, may have sustained water in Mortenson Lake proper, but it is unknown whether they are natural or induced from human activities. Mortenson Lake is the western-most lake followed by Garber Lake, Soda Lake, and Gibbs Lake. Meeboer Lake, which lies between Garber and Soda lakes, is owned by the Wyoming Game and Fish Department.

Mortenson Lake receives water from springs to the west and south, as well as irrigation return flows from waters out of the Pioneer ditch. The lake is mostly open water, with cattail and hardstem bulrush patches around the edges and extensive amounts of rushes and sedges along the north, west, and south shores. Prior to refuge acquisition, Mortenson Lake was used for irrigation of nearby lands and was typically at least partially drawn down in the summer.

Garber Lake is a small, mostly open water area immediately east of Mortenson Lake. Waters from Mortenson Lake are picked up in the Osterman ditch and feed into Garber Lake. An outlet on the lake's northeast corner allows water to flow out of Garber Lake and back into the Osterman ditch. Sedges and rushes border Garber Lake along with some hardstem bulrush.

Soda Lake, a long, narrow lake just east of the Meeboer Lake State Wildlife Area, receives water either from Meeboer Lake or from the South ditch, which comes in from the northwest. Both of these water sources can use and regularly do use water that has come through Mortenson Lake. Soda Lake is situated between steeper terrain on the north and south, resulting in little emergent vegetation along its shores. There are small areas of hardstem bulrush and some rushes and sedges.

Gibbs Lake is a small, shallow area that is prone to drying out. When dry it is very alkaline. Water can be moved to Gibbs Lake from the South ditch. There is little vegetation along this pool except for rushes and sedges at the extreme high waterline.

The playa is a small, low spot southeast of Gibbs Lake, which is split by Highway 230. There is no water source for this pond, and it is usually dry with an alkaline surface.

Harmon Reservoir is south of Soda Lake and consists of a fairly large dike crossing the natural

drainage and a small outlet pipe that was historically used to supply ditches that ran on either side of the drainage for flood irrigation. Low priority limits the ability to use a water right due to holders of higher-priority rights using available water flows in all but wet years. Consequently, this area sees water rarely enough that most of the vegetation in the bottom and along shorelines is more typical of surrounding uplands habitat than wetlands.

Submergent vegetation is present in Mortenson, Garber, and Soda lakes but not in large quantities, probably due to the saline conditions of the substrate.

The endangered Wyoming toad is found along the shores of Mortenson Lake and occasionally around Garber Lake, along with boreal chorus frogs. Significant numbers of redheads, lesser scaup, canvasback, and bufflehead are seen during migration (June–July and September) on Mortenson, Garber, and Soda lakes. Various dabbling ducks, coots, eared and pied-billed grebes, Canada geese, and black and Forster's terns are regularly observed on these lakes in the summer. American avocets, killdeer, and dabblers use Gibbs Lake.

Established for the endangered Wyoming toad, and managed in conjunction with recommendations from the Wyoming Toad Recovery Team, the area around Mortenson Lake proper has received active management (grazing, rest, prescribed fire) for the benefit of the Wyoming toad.

In 1992, a cooperative agreement with an adjacent landowner was established regarding the exchange of water shares for grazing privileges. This agreement remains in effect, with refuge staff directing grazing on the refuge to benefit the Wyoming toad and receiving water for refuge purposes. Water management activities are performed by the grazing permittee and generally consist of opening the south ditch headgate, which allows water to flow into refuge wetlands from approximately May 1 to September 11. As a result, the refuge receives an average of 232 acre-feet of water per year. The majority of the water is used to fill wetlands on the eastern section of the refuge.

Water Management History of Mortenson Lake NWR

The prior landowner who purchased Mortenson Lake and surrounding land in 1972–73 would typically begin drawing down Mortenson Lake in May for irrigation and continue to draw it down until about July 1, when the area would be dried out for haying. It was not uncommon for the lake to refill by mid- to late August, when more irrigation would occur to moisturize the ground before winter. Water levels in the lake were held full throughout the summer when possible. In 1991, the Nature Conservancy (TNC) purchased Mortenson Lake and surrounding land.

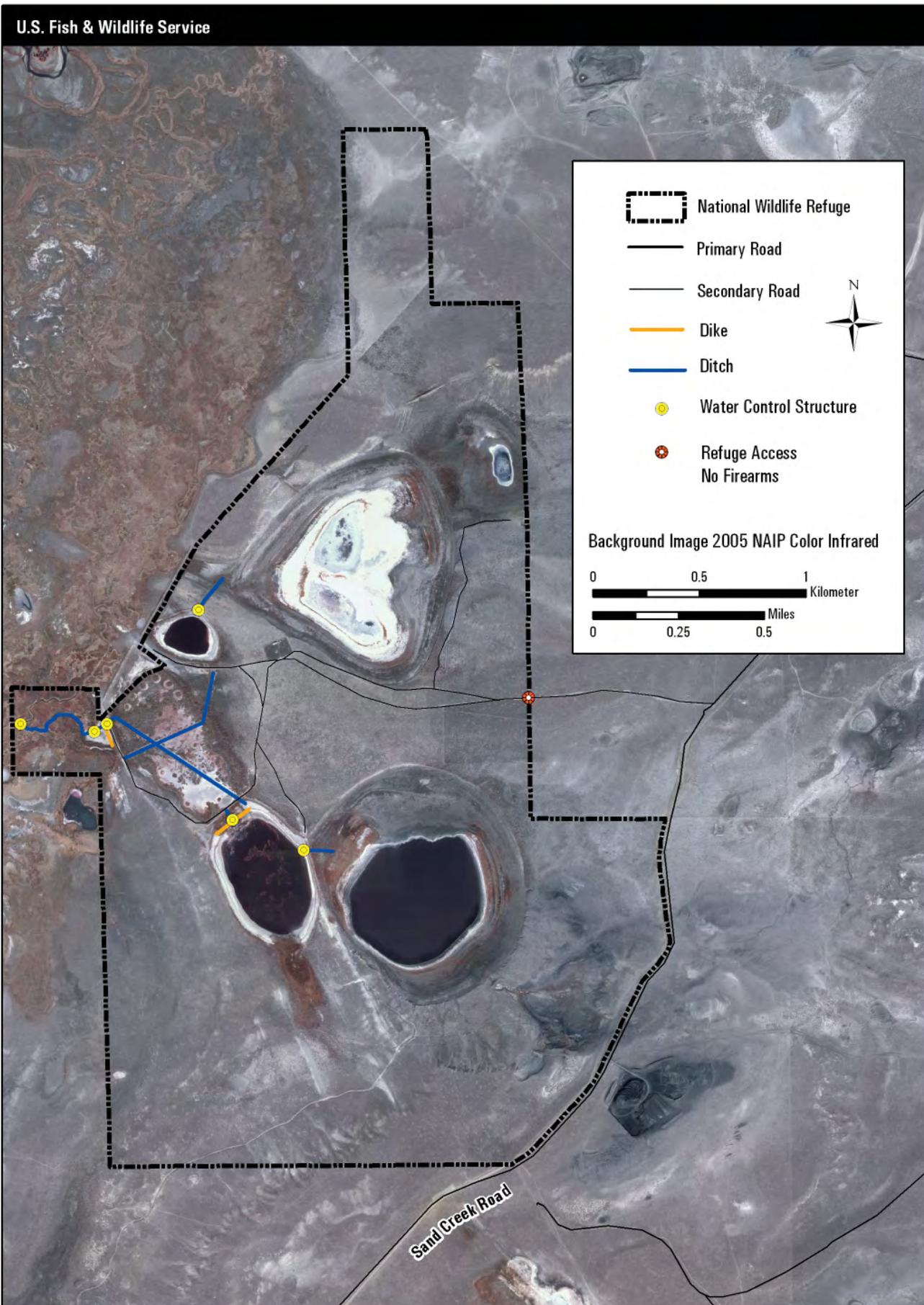


Figure 11. Infrastructure and public use areas at Hutton Lake NWR, Wyoming.

The Service purchased Mortenson Lake and surrounding area from TNC in May of 1993, creating what is now Mortenson Lake NWR. Sometime in the early 1990s, a water control structure was installed on the southern berm of the lake just off the dike, which raised the lake level. From 1993 through 2002, the water level in Mortenson Lake was held full from the spring through the fall. Boards were removed from the structure to slightly lower the water level each fall and reinstalled sometime in late March or early April. The reasons for lowering the lake level are twofold: (1) the high water levels through the winter are believed to negatively impact Wyoming toad hibernation, and (2) higher water levels can erode the dike, especially when ice melts.

Due to drought conditions, lake levels in 2003 and 2004 were not as full as in the past. In 2005, water levels were intentionally dropped starting in May and continuing through June to mimic historic water management. Overall, the lake water level was dropped a little over 1 foot. In the fall of 2005, the lake level did not return to full as it had historically due to a dry year. In 2006, a managed drawdown was accomplished, with lake levels returning to normal by fall.

Upland Habitat: Brush and Grasslands

Uplands consisting of brush and grasslands is the dominant habitat type in the Laramie Basin, encompassing most of the lands not within an existing floodplain and below the mountains. Where access to water exists or has existed, some of these upland areas are in hay production, and the influence of past attempts at haying are still apparent from the existing vegetation. The uplands on the three Laramie Plains refuges are very similar, though subtle differences exist. Most of the soils in the uplands have alluvial origins, and many are influenced locally by differing water regimes that affect vegetation. In general, these lands appear to be unbroken, and given the undulating or sloped conditions of many sites thoughts of seeding in the past were likely dismissed.

Uplands of Bamforth NWR

Uplands range from the top of the bench forming the Big Basin through an area intermittently irrigated by the Park ditch to poorer soils abutting alkali flats or alkaline ponds. The vegetation on the bench is sparse grasses included western wheatgrass, needleandthread, and bluegrass, as well as some rabbitbrush and sagebrush. The area influenced by irrigation is more grass dominated with less bare ground; grasses are assumed to include western and bluebunch wheatgrass and possibly introduced forage-producing species. The area closer to the alkaline sites can be quite barren with 80–90 percent bare ground and only greasewood or black sage for

vegetative cover, although certain spots include saltgrass in the mix.

Uplands of Hutton Lake NWR

Uplands range from the shorelines of Hutton and Creighton lakes up to the highest benches, approximately 100 feet above the lakes. Soil characteristics result in some vegetative variability. The relatively flat area between the lakes is dominated by a large prairie dog town. This area is sparsely vegetated, with few grasses, several types of annual weeds and forbs, prickly pear, and greasewood on the south. In general, the southern uplands are more grass dominated and the north holds a little more greasewood, but openings in the brush and greasewood plants can be found throughout the refuge. The greasewood plants are especially thick and tall (4–5 feet) northeast of Creighton Lake, east of Hutton Lake, and along the spoil piles northeast of Hoge and Rush lakes. An area in the southwest corner of the refuge has been irrigated in the past and holds a thicker, more grass dominated regime than the rest of the refuge uplands. Vegetative species include western and bluebunch wheatgrass, needleandthread, and rabbitbrush.

Uplands of Mortenson Lake NWR

The south half of Mortenson Lake NWR consists of a terrace of gravelly soils with a mound-intermound pattern of microrelief. This terrace slopes down to the lakes of the refuge to the north, where between the pools and waterways feeding them, more gravelly, well-drained upland soils exist. Vegetation on the terraces is dominated by needleandthread, western and bluebunch wheatgrass, larkspur, and rabbitbrush. On the uplands not associated with the terraces vegetation consists of mostly the same species but also includes greasewood and more open ground. The slopes contain most of the same species but also includes sparsely spaced big sagebrush plants.

Characteristic wildlife of the Laramie Plains uplands habitat includes pronghorn, horned larks, and meadow larks. White-tailed prairie dogs are common on Mortenson Lake NWR and Hutton Lake NWR.

Grazing Management History at Bamforth NWR

Grazing has occurred on Bamforth for at least the past 35 years, most recently in cooperation with an adjoining landowner. Lack of fencing limits the ability to adequately manage grazing, but it is assumed that the current grazing regime is not detrimental to the area, based on observations of similar grazing regimes used on refuges in the region. Future monitoring and evaluation will ensure that grazing management is appropriate and compatible.

Grazing Management History of Mortenson Lake NWR

The landowner who purchased Mortenson Lake and the surrounding land in 1972–73 would typically put cattle on the middle pasture known as the Meeboer pasture (south and east of Meeboer Lake) in March or April, usually feeding the cattle until new growth started. The cattle were not brought onto the Mortenson Lake pasture until the tall larkspur, which grows along the hillside south of the lake, had stopped flowering and was no longer poisonous to cattle. After the first of July, 200–225 pair of cattle were brought to the pasture and grazed for most of the summer. At that time, a much larger area was available for grazing, as the pasture included the area immediately north of the refuge boundary fence, just north of Mortenson Lake. This fairly well-irrigated north portion of the historic pasture is still in private ownership, producing good forage now and in the past. Consequently, it has seen a lot of use by the cattle, which has also resulted in greater use of the north shore of Mortenson Lake, as cattle come in from the north to water and graze and rest there. The former landowner has stated that cattle use of the north shore is noticeably diminished now compared to in the past due in part to the boundary fence and easier grazing to the south and east of Mortenson Lake. Another reason is a change in vegetation; the area is now mostly comprised of rushes and carex, making it less enticing to cattle.

During the period when TNC owned Mortenson Lake and the surrounding land (1991–93), grazing was discontinued. Reintroduced by the Service, grazing at Mortenson Lake NWR under Service management has changed over the years. For the first two years (1993–94), cattle were allowed to graze the whole pasture encompassing Mortenson Lake. In 1994, an electric fence was constructed in the field to protect the outlet portion of the lake, which was thought to be prime Wyoming toad habitat. The fence was also used to concentrate the cattle in the more alkali/bulrush vegetation surrounding the north side of the lake to thin the vegetation for the toads. The electric fence was maintained over the next six years, with cattle using annually in the fall 28–90 AUMs around the shore of Mortenson Lake and 180–340 AUMs in the rest of the field.

In 2000, the fence was modified to eliminate cattle access to the dike because of erosion issues. Each fall through 2003, cattle used 32–72 AUMs along the lakeshore and 52–340 AUMs in the rest of the field.

In the fall of 2003, the planned 2004 grazing regime was changed on the advice of the Wyoming Toad Recovery Team. Shoreline vegetation had become too dense, and the open habitats documented as needed by the Wyoming toad (Withers 1992) were no longer available. The density of the vegetation had also potentially decreased temperatures in historic

breeding areas, making them less suitable for the toad. Although Withers (1992) had documented breeding on the northeast and southeast shores of Mortenson Lake, during 2001 and 2002 egg laying had only occurred on the northwest shore in areas with adjacent open vegetation, and in 2002 tadpoles had been found only on grazed lands adjacent to the northwest shore of Mortenson Lake.

In 2004, the following change to grazing was made based on the recommendations of the previous landowner whom the Service had contacted to discuss historic land use practices. The electric fence was installed and cattle were allowed to access the shore of Mortenson Lake from July 13 through September 1, using 102 AUMs. The cattle were then moved to the main pasture from September 9 through October 26, using 108 AUMs.

The electric fence was not installed in 2005, and cattle grazed in the fall from October through November, using 255 AUMs. This grazing occurred after a prescribed fire of 22 acres was conducted on the north side of the lake in the spring. The prescribed burn was an attempt to remove the heavy rush and carex vegetation along the north shore of the lake, as cattle grazing was not having the desired effect of reducing this vegetation.

In 2006, cattle were again allowed to graze the entire pasture (no electric fence) in July, using 94 AUMs. The cattle were removed in late July and then allowed back in the field in October, using another 58 AUMs.

Alkali Flats

Alkali flats are predominately flat lands and seasonally dried-up wetland basins with strongly saline soils. These areas are associated with or adjacent to playas or intermittent lakes. The alkaline/saline soils appear to severely restrict plant growth, as vegetation is very spotty throughout much of this area. Vegetation includes salt grass, alkali sacaton, and greasewood. Wildlife use of the alkali flats is generally limited to migratory shorebirds, mostly killdeer and American avocet (likely in association with water nearby).

Alkali Flats of Bamforth NWR

Approximately one-third to one-half of Bamforth NWR is alkali flats, depending on water levels.

Alkali Flats of Hutton Lake NWR

A small playa northeast of Creighton Lake on Hutton Lake NWR may be described as alkali flats.

Alkali Flats of Mortenson Lake NWR

Mortenson Lake NWR has one alkaline playa, and Gibbs Lake, when drawn down, becomes alkaline.

Irrigated Meadows

Irrigated meadows are found only in a small area on the west portion of Hutton Lake NWR and in a few scattered locations on Mortenson Lake NWR. These areas are characterized by the presence of hydric soils and plants, and no distinction has been made as to whether they are naturally occurring or a manufactured condition because the total area of land involved is minimal. Characteristic vegetation may include creeping meadow foxtail, and other species introduced for hay production, as well as Baltic rush, Nebraska sedge, cattail, and hardstem bulrush. Wildlife use include sora, Wilson's phalarope, yellow-headed blackbird, red-winged blackbird, white-faced ibis, waterfowl (dabblers), and marsh wrens.

Irrigated Meadows of Hutton Lake NWR

The meadows on Hutton Lake NWR are within the floodplain of Sand Creek and likely were historically flooded seasonally during runoff. The diversion structure on Sand Creek that brings water into the refuge is in this area. When the structure is open or if the neighbor is irrigating the adjacent ground, this area is flooded—sometimes for extended periods—depending on water availability.

Irrigated Meadows of Mortenson Lake NWR

Mortenson Lake NWR meadows include subirrigated areas on the northwest and south side of Mortenson Lake, as well as irrigated lands between Mortenson and Meeboer lakes and between Soda and Gibbs lakes. As previously mentioned, it is conceivable but unknown as to whether these areas were naturally wet meadows prior to European settlement. If the springs that help feed Mortenson Lake waters are a historic part of the landscape, they could have helped keep Mortenson Lake full, and overflowing, which would have irrigated some of these lands. If these springs are the result of uphill irrigation, well development, or other constructions, the irrigated meadows are fairly recent to the landscape.

Contaminant Assessment

Contaminant assessment for the Laramie Plains refuges are based on the results of baseline studies of environmental contaminants and land usage described below.

Contaminant Assessment for Bamforth NWR

A baseline study investigating trace elements in various media on the refuge was conducted from 1991 to 1993 (Dickerson and Ramirez 1993). Lead was slightly elevated in Bamforth Lake water samples (0.143–0.164 mg/l). Selenium was elevated in vegetation (3.28–4.26 ug/g) and sediment (28.6 ug/g).

Selenium concentration in American avocet eggs ranged from 3.10 to 5.30 ug/g. Arsenic was slightly elevated in vegetation (24.5–49.2 ug/g) and aquatic invertebrates (23.1–33.1 ug/g), and boron was slightly elevated in vegetation (303 ug/g).

Cattle grazing and irrigated pasture lands are the primary use of the upland areas on the refuge. The possibility for spills to occur on or near the refuge is remote.

Contaminant Assessment for Hutton Lake NWR

A baseline study of environmental contaminants, primarily trace elements, was performed at Hutton Lake NWR in 1988 and 1989 (Ramirez and Armstrong 1992). Trace elements were not present in concentrations adverse to fish and wildlife. Aerial spraying for mosquito control is conducted on the private land located over 1 to 2 miles to the north. *Bacillus thuringiensis* (Bt) is applied on lands adjacent to the refuge for mosquito control. Grazing is the main use of this land.

Baseline sampling areas identified for Hutton Lake NWR include the four main lakes at the refuge: Hutton Lake, Rush Lake, Creighton lake, and Lake George. Contaminants assessment process information should be reviewed in 5 years. Managers should monitor mosquito-spraying activities to ensure that the refuge is not accidentally sprayed.

Contaminant Assessment for Mortenson Lake NWR

A baseline study of environmental contaminants, primarily trace elements, was performed at Mortenson Lake NWR in 1988 and 1989 (Ramirez 1992). Trace elements were not present in concentrations adverse to fish and wildlife. Aerial spraying for mosquito control is conducted on the private lands in the basin and on lands adjacent to the refuge. Bt is also applied on lands adjacent to the refuge and used within the refuge for mosquito control. Grazing is the main use of this land.

Contaminants assessment process information should be reviewed in 5 years. Managers should monitor mosquito-spraying activities to ensure that the refuge is not accidentally sprayed.

A recent investigation (Dickerson, Hooper, Huang, and Allen 2003) assessed pesticide aerial drift from mosquito control activities on lands adjacent to the refuge. Pesticide indicator strips and spray cards were used to determine the extent of malathion entering the refuge and potential reintroduction sites. Aquatic invertebrate abundance was not significantly different ($p < 0.05$) before and after spraying at any sites except the reference site and Meeboer Lake. No malathion residues were detected in the aquatic invertebrates. Results from this study indicated that, although some drift of malathion was occurring, the toads were not

exposed to concentrations great enough to reduce adult survival, affect predator avoidance behavior, or reduce their food source.

Recent study results (Little, Calfee, and Dickerson 2002) show that ammonia nitrate is not currently elevated to concentrations that would adversely affect the Wyoming toad. Increases in nitrogen input, such as what might occur with changes in land use, could increase the risk for adverse effects to the toad, particularly because ammonia nitrate concentrations may act synergistically with other environmental factors or may serve as a stressor for increasing the toads' susceptibility to disease. Periodical sampling of water from the refuge will ensure that nitrogen input does not increase to concentrations exceeding the tolerance level of Wyoming toads.

Threatened and Endangered Species

Mortenson Lake NWR was established in 1993 to protect the Wyoming toad's last known population. The Wyoming toad was listed as an endangered species in 1984; the population at Mortenson Lake was discovered in 1987.

At the present time, no known threatened or endangered species use Bamforth NWR or Hutton Lake NWR. Hutton Lake NWR has been a site for

Wyoming toad releases in the past. Refuge staff would continue to facilitate the use of Hutton Lake NWR as a release site for the Wyoming toad, per Recovery Team recommendation.

Species of Concern

Table 4 indicates documented occurrences of vertebrate species of concern within the Laramie Plains refuges (Keinath, Heidel, and Beauvais 2003).



View of Mortenson Lake.

Table 4. Documented occurrences of vertebrate species of concern within Laramie Plains refuges, Wyoming.**Bamforth NWR**

<i>Species</i>	<i>Most Recent Observation</i>
American bittern	1911
American white pelican	unknown
Black tern	unknown
Black-crowned night-heron	unknown
Black-footed ferret	1977
Burrowing owl	1982
California gull	unknown
Caspian tern	unknown
Common loon	1933
Dwarf shrew	1987
Forster's tern	unknown
Herring gull	unknown
Iowa darter	unknown
Merlin	unknown
Mountain plover	1993
Northern leopard frog	1999
Preble's meadow jumping mouse	1968
Snowy egret	unknown
Swift fox	1988
White-faced ibis	1988
Wyoming toad	1963

Hutton Lake NWR

<i>Species</i>	<i>Most Recent Observation</i>
American avocet	2005
American bittern	1994
American dipper	1997
Bald eagle	2004
Black tern	unknown
Black-crowned night-heron	unknown
Black-footed ferret	1964
Black-rosy finch	1992
Brewer's sparrow	2005
Burrowing owl	1991
California gull	2005

Table 4. Documented occurrences of vertebrate species of concern within Laramie Plains refuges, Wyoming.**Hutton Lake NWR**

<i>Species</i>	<i>Most Recent Observation</i>
Chestnut-collared longspur	2005
Common goldeneye	2002
Common loon	1998
Ferruginous hawk	2004
Forster's tern	unknown
Golden eagle	2004
Hammond's flycatcher	1911
Long-billed curlew	2004
McCown's longspur	2005
Merlin	2004
Mountain plover	2005
Preble's meadow jumping mouse	2005
Sage thrasher	2005
Short-eared owl	1995
Snowy egret	unknown
Swift fox	2002
Western scrub-jay	2002
White-faced ibis	1994
White-tailed prairie dog	2005
Wyoming toad	2000

Table 4. Documented occurrences of vertebrate species of concern within Laramie Plains refuges, Wyoming.**Mortenson Lake NWR**

<i>Species</i>	<i>Most Recent Observation</i>
American avocet	2005
Black-footed ferret	1964
Brewer's sparrow	2005
California gull	2005
Chestnut-collared longspur	1982
Common loon	1990
Long-billed curlew	2004
McCown's longspur	2005
Mountain plover	2005
Ringtail	1993
Sage sparrow	1982
Sage thrasher	2005
Sandhill crane	2005
Swift fox	1965
Tiger salamander	1989
White-faced ibis	1998
White-tailed prairie dog	1978
Wyoming toad	2007

4.3 CULTURAL RESOURCES

Prehistoric Resources

The available archaeological record of the Laramie Plains is fairly limited due to the presence of primarily private lands in the area. The only surveys conducted in Albany County have been on Hutton Lake NWR in conjunction with pipeline installations.

Larson and Letts (2003) propose that although the record is thin, the fact that prehistoric use of the area is indicated by the few sites inventoried points to significant use of the area by indigenous peoples. Sites that have been found during surveys include fire hearths, lithic scatters (cultural artifacts made primarily of stone), and quarry sites. The Arapaho, Cheyenne, and Sioux are presumed to have been the predominant tribes that used the area prior to European settlement (U.S. Department of Agriculture 1998).

Early Exploration

As is the case with much of the West, the early exploration of the Laramie Plains owes much of its beginnings to the fur-trapping trade. In 1820, Jacques LaRamie ignored the warnings of other trappers about hostile Native Americans and ran a trapline farther up the river that now bears his name. The Native Americans reportedly killed him and stuffed his body under the ice of a beaver pond. Although LaRamie met an untimely end, he became the namesake of a county, city, river, mountain range, and basin (Larson and Letts 2003).

Early Settlement

With the Overland Trail came the Overland Stage Company, owned by Ben Holladay, “the Stagecoach King.” The company constructed stage stops at regular intervals along the route of the trail, which were some of the first Euro-American structures in the Laramie Basin. The first homestead in the basin was built in 1859 by Phil Mandel along the Little Laramie River. It also served as a stage station for the Overland Trail. Mandel sold replacement stock to travelers and later cut and sold hay to soldiers at Fort Sanders, south of present day Laramie.

Fort Sanders was constructed along the Overland Trail in 1866 to protect travelers on the Overland Stage Line and in preparation of the railroad. The decision to run the Union Pacific Railroad through the Laramie Basin stands as the most influential event in the shaping of the area’s history. Several rail stations were constructed to service the line, and the city of Laramie became a primary supply source for railroad needs.

Ranching was also instrumental to the settlement of the area. In 1865, Tom Alsop was forced to abandon his oxen and wagon train in a snowstorm. He returned the following spring and was surprised to find all of the livestock alive and in good shape. Three years later, he and Charlie Hutton created the Hutton Ranch (also known as Hart Ranch), raising cattle and sheep in the basin. Although livestock can fare well during the Laramie winters, occasionally shepherds have lost entire flocks of sheep due to severe winter conditions (Larson and Letts 2003).

History of Development

Besides the homesteading tied to operation and services along the Overland Trail and the railroad, agriculture was also a key to settling the area and influencing the look of the land. Construction of houses, barns, and outbuildings were likely followed shortly by fences. Then, in the late-nineteenth and early-twentieth centuries, irrigation ditches were constructed in the basin, with the idea of crop production. Unfortunately, it was soon discovered that the short frost-free season made farming a less-than-profitable venture. Many of the old irrigation ditches and canals are still in use today, mostly for hay and some alfalfa production.

Some mining has occurred in Albany County, primarily in the mountains. Titanium, gold, silver, and copper mines have been developed in the Medicine Bow Mountains, and oil fields lie west of Laramie.

A recent economic activity has been energy generation through wind farms constructed in the northwest part of Albany County. The primary economic industries in the area today are the University of Wyoming, ranching, tourism, and the Monolith Cement Plant (Larson and Letts 2003).

4.4 SPECIAL MANAGEMENT AREAS

This section describes the special management areas of the Laramie plains national wildlife refuges.

Wilderness

Due to the small size of the refuges and current and past land use patterns, the refuges do not appear to meet the criteria for wilderness. As outlined in the Wilderness Act of 1994, a wilderness area:

- generally appears to have been affected primarily by the forces of nature, with the human imprint substantially unnoticeable;
- offers outstanding opportunities for solitude or a primitive and unconfined type of recreation;

- has at least 5,000 acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition;
- may contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

Important Bird Area

The Laramie Plains refuges, particularly Hutton Lake NWR, are included in the Laramie Plains Lake Important Bird Area (IBA) recognized by the Audubon Society in partnership with Birdlife International. According to Alison Lyon Holloran (conservation coordinator, Audubon Wyoming; personal communication, 2006), this designation was given to the Laramie Plains refuges in 2003. The refuges meet four of five criteria for establishment of an IBA including:

- endangered/threatened species (Wyoming toad, Preble's meadow jumping mouse);
- other high conservation priority species (white-faced ibis, American white pelican);
- rare, unique, or representative habitat (high-prairie wetlands);
- significant concentration of waterfowl, gulls, and wading birds.

The only IBA criterion that is not currently met is long-term research.

4.5 VISITOR SERVICES

Refuge infrastructure (roads, fences, water control structures) and public use facilities (parking areas, walking trails) are shown on the following maps for Bamforth NWR (figure 12), Hutton Lake NWR (figure 11), and Mortenson Lake NWR (figure 13).



Hunting opportunities exist in nearby areas.

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Visitor Services at Bamforth NWR

No public use is allowed on Bamforth NWR. The refuge lands are separated into three parcels with private or state lands between them and have seen little active management in several decades. In addition, the soil types and moisture content in the area preclude adequate fence construction in some portions of the refuge. Consequently, much of the refuge boundary is unfenced and unsigned, creating potential trespass problems if visitation were allowed on the refuge.

One public road (Highway 12) traverses the southwest corner of the southwest parcel of the refuge, which offers distant views of area wetlands and other habitats on the refuge.

Visitor Services at Hutton Lake NWR

Opportunities for four of the six priority public uses identified in the Improvement Act are available at Hutton Lake NWR.

Hunting

Many hunting opportunities exist in nearby areas, and Hutton Lake NWR provides a place for members of the nonhunting public to experience safe, nonconsumptive wildlife-dependent recreation during hunting seasons.

Due to the small size of the refuge and existing hunting opportunities in the area, the refuge will remain closed to hunting.

Fishing

Fishing is not permitted on Hutton Lake NWR. Unreliable water supplies with diminishing water quality over time in refuge impoundments precludes establishment of a viable fishery.

Wildlife Observation and Wildlife Photography

There are no formal opportunities for these activities, but opportunistic means are available. Although there is not a designated auto tour route on the refuge, 2.75 miles of gravel road are currently open to public travel (see figure 11). These roads allow visitors to traverse all major habitat types on the refuge, including uplands with prairie dog towns, grasses and shrubs used by pronghorn and sage thrashers, and refuge impoundments hosting a variety of water dependent birds. Facilities that would aid the public in conducting wildlife observation and photography such as photo blinds, observation blinds, and interpretive panels do not exist at the refuge.

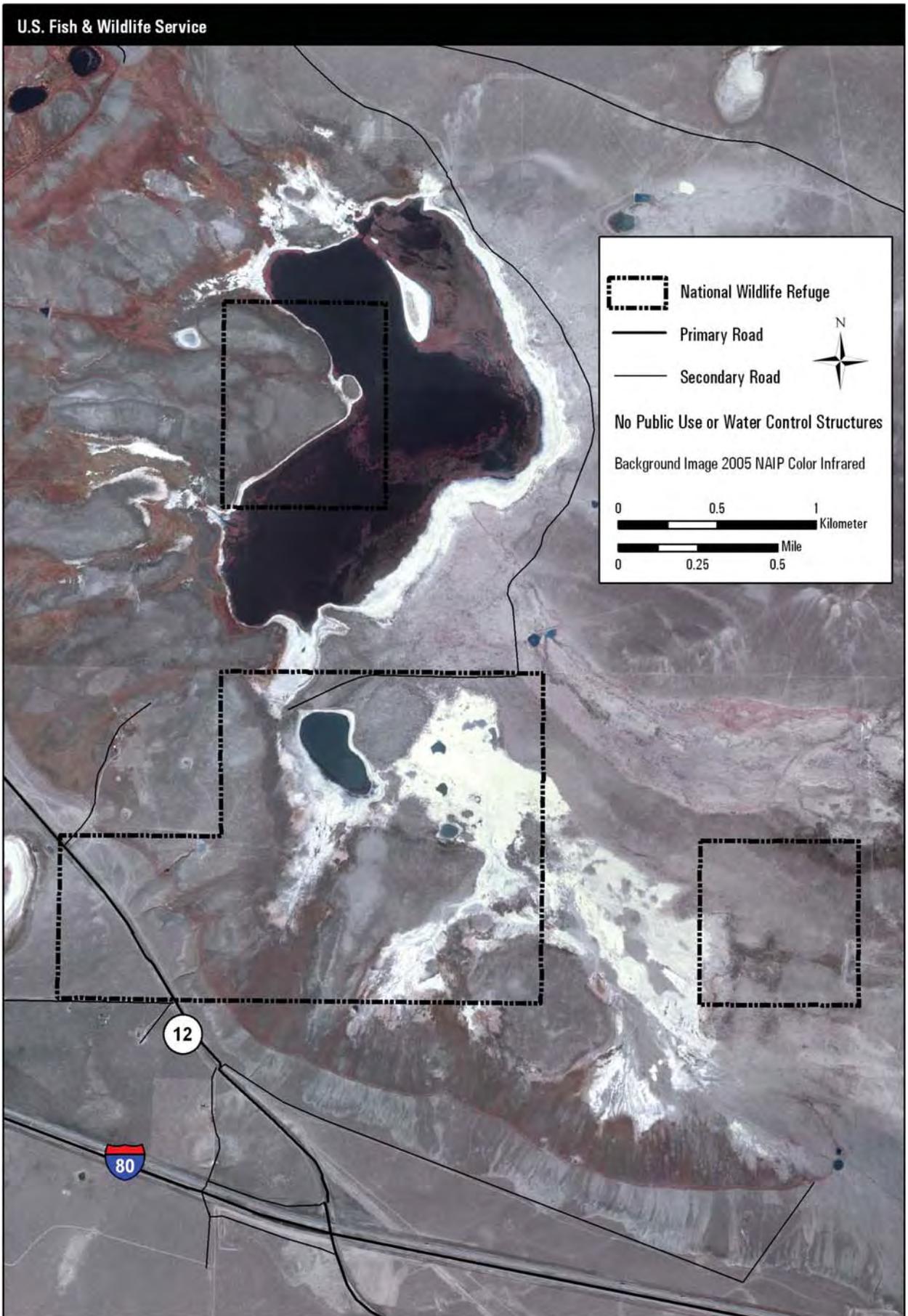


Figure 12. Infrastructure and public use areas at Bamforth NWR, Wyoming.

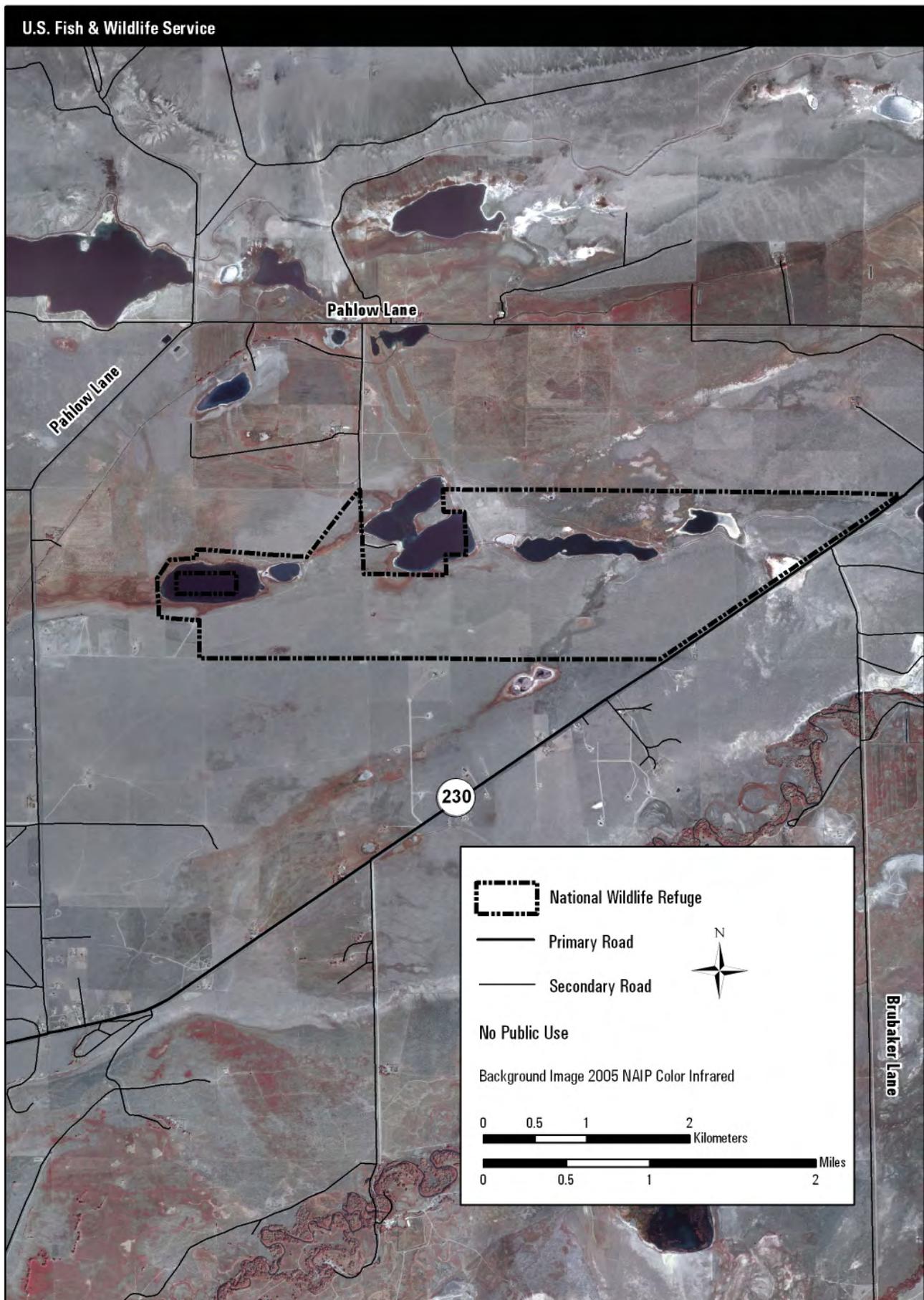


Figure 13. Infrastructure and public use areas at Mortenson Lake NWR, Wyoming.

Interpretation and Environmental Education

As previously mentioned, interpretive panels, tour routes, nature trails, or other interpretive facilities do not exist at the refuge. Staff are only occasionally on site, as there is not a visitor center on the refuge. An undated general information pamphlet and a 1972 bird list are available and sent to interested parties who contact the refuge staff located at Arapaho NWR with a request. Occasional requests for tours and talks from scout groups, schools, and nonprofit organizations are addressed on a case-by-case basis; the refuge biologist generally handles these requests.

Visitor Services at Mortenson Lake NWR

Because the refuge was acquired for the express purpose of preserving the endangered Wyoming toad, public use is currently not permitted on the refuge to prevent potential adverse impact on the toad. The refuge does not have any visitor services facilities such as interpretive panels, nature trails, and kiosks. Requests for refuge tours, studies, and other uses are addressed on a case-by-case basis.

4.6 PARTNERSHIPS

Refuge staff work with the following partners to perform natural resource management at the Laramie Plains refuges:

- Wyoming Toad Recovery Team to achieve population recovery goals for the Wyoming toad;
- Albany County Weed and Pest to assist with management of invasive species on the refuges;
- Wyoming Audubon Society to develop nonconsumptive wildlife-dependent recreation opportunities at Hutton Lake NWR;
- Wyoming Audubon Society to conduct annual breeding bird surveys on Hutton Lake NWR.

4.7 SOCIOECONOMIC ENVIRONMENT

The local and regional demographics (statistical data about the population) are described below for the communities in the four-county study area pertaining to the Laramie Plains refuges.

Socioeconomic Conditions

The following section illustrates the current socioeconomic conditions found within the study

area, which is comprised of Albany, Carbon, Platte, and Laramie counties. The Laramie Plains refuges are located within Albany County; however, the remaining three counties included in the study area are located in close proximity to the refuges and could be affected by refuge management decisions.

Background

The Laramie Plains refuges encompass a total of 4,860 acres of open water, wetland, grassland, and sagebrush, the largest of which is the Hutton Lake NWR at 1,968 acres. Mortenson Lake NWR and Bamforth NWR are closed to public access, but Hutton Lake NWR provides the public with opportunities for wildlife viewing, photography, and environmental education. If the refuges attract visitors to the area, some economic benefit to local communities may result. Food, gas, and lodging purchases, spurred by visitation to the refuges, would provide local businesses with supplemental income and increase the local tax base. Management decisions affecting the Laramie Plains refuges may influence visitation levels, which in turn affects visitor spending in the local economy.

Figure 14 shows the location of the Laramie Plains refuges in relation to nearby centers of economic influence. The refuges are located in southeastern Wyoming near the cities of Laramie and Cheyenne.

Population

The study area population has remained steady since 2000 and was approximately 140,000 in 2005. Over the same five-year period, the population of Wyoming decreased by 15,500 residents (figure 15). The study area contained 27 percent of Wyoming's population as of 2005. Two of Wyoming's largest cities (Cheyenne and Laramie) are located within the study area and provide an ample tourist base for the refuges.

Age

Figure 16 illustrates the aging population of the study area. In 2000, about 24 percent of study area population was under the age of 18; this age group is expected to constitute just 21 percent of the population by 2011. The median age of the study area is estimated at 36.02 years as of 2006.

Employment

The civilian workforce for the study area has increased by about 560 workers per year since 2000. As of 2006, the study area labor force is about 69,177 workers. The unemployment rate for 2006 is estimated at 3.19 percent, which is slightly lower than the state's 3.5 percent unemployment rate. Both the study area and the state have a lower unemployment rate than the nation, which was 4.4 percent as of October 2006 (U.S. Bureau of Labor

Statistics, Employment Situation Summary, October 2006).

Local Industry

Sales and office occupations are the largest employment sector at 30 percent (figure 17). Professional and related occupations employ 22 percent, while farming, fishing, and forestry occupations employ 1 percent of the labor force.

Refuge Activities

Bamforth NWR and Mortenson Lake NWR are closed to public access. Hutton Lake is open for nonconsumptive wildlife-dependent recreation, which includes wildlife observation, photography, environmental education, and interpretation. Hunting and fishing are not permitted.

Visitation and Visitor Spending

Laramie is the primary center for visitation and potential use for all three Laramie Plains refuges. The city was home to 27,204 residents in 2000. With the University of Wyoming based in Laramie, requests for field trips, and field activities for university classes on the refuges (mainly Hutton Lake) are common. This academic base and urban population show interest in natural resources in various forms. Audubon Wyoming and the local Audubon chapter are based in Laramie.

The U.S. Forest Service and Bureau of Land Management manage 674,479 acres of land in Albany County available for hunting, fishing, and camping, and several state wildlife areas also allow these public uses.

Hutton Lake NWR received only 2,000 visitors last year due to its small size and minimal marketing efforts. According to Ann Timberman (project leader, Arapaho NWR; personal communication, January 2007), the majority of these visitors likely reside in the local area. Without the addition of nonlocal visitors, increased economic activity in the area as a result of visitation to the Hutton Lake NWR is unlikely.

Employment Estimates

The presence of the University of Wyoming in Laramie strongly influences Albany County's occupational demographics. The county ranks the highest in the state in the percentage of residents claiming management, professional, and related occupations (includes education) at 40.4 percent, compared to a statewide figure of 30.0 percent.

The rest of the occupational breakdown for the county is as follows, with state figures in parentheses: 23.2 (24.2) percent in sales and office; 18.9 (16.7) percent in service; 8.5 (12.8) percent in production, transportation, and material moving; 7.6 (14.8) percent in construction, extraction, and maintenance; and 1.4 (1.5) percent in farming, fishing, and forestry. Of these occupations, 31.2 percent are government jobs (local, state or federal), which includes university employees. This figure is again the highest in the state and well above the state average of 20.4 percent government workers.

According to the 2000 census (U.S. Census Bureau 2000), 91.3 percent of Albany County residents were white compared to 92.1 percent of Wyoming as a whole. Of the 32,104 residents in the county, 2,397 claimed Hispanic/Latino origin, putting this group at 7.5 percent of the county populace compared to 6.4 percent of the state populace. Other ethnicity information for the county includes 1.7 percent Asian, 1.1 percent Black or African American, 1.0 percent American Indian and Alaska Native, and 0.1 percent Native Hawaiian and other Pacific Islander; 2.6 percent claimed some other race, and 2.2 percent claimed two or more races.

Education

Albany County surpasses the state of Wyoming in the percentage of the population 25 or older that have graduated from high school (93.5 percent verses 87.9 percent), and in residents who have earned a bachelor's degree or higher (44.1 percent verses 21.9 percent).



Northern pintail



Figure 14. Laramie Plains NWRs in relation to nearby centers of economic influence.

SOURCE: NATIONALATLAS.GOV AND BCC RESEARCH & CONSULTING

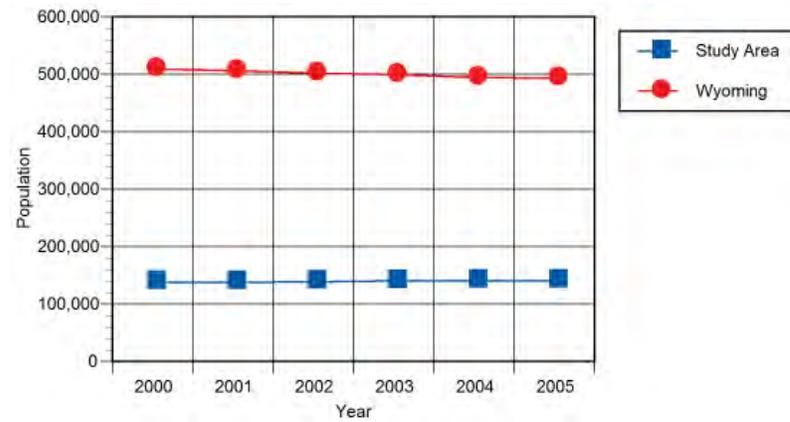


Figure 15. Wyoming and study area population.

SOURCE: STATE OF WYOMING, ECONOMIC ANALYSIS DIVISION.

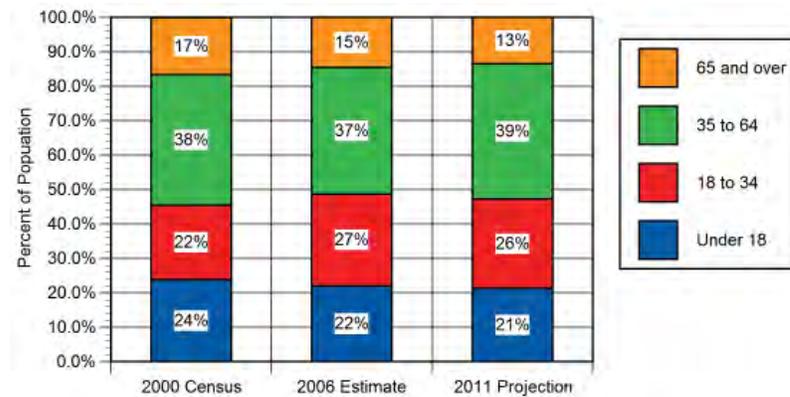


Figure 16. Study area age composition.

SOURCE: U.S. CENSUS BUREAU, PCENSUS 2006.

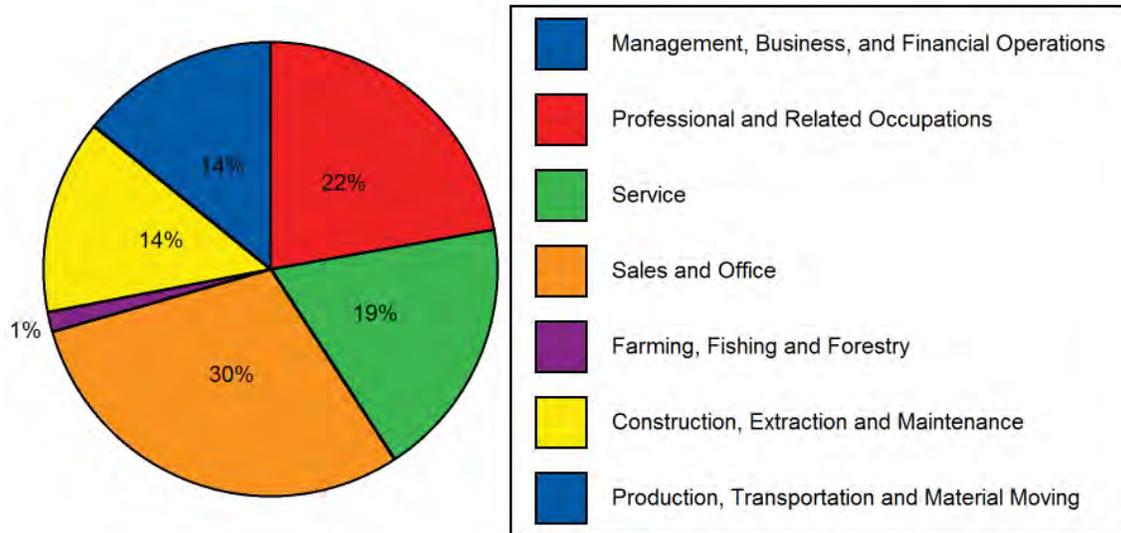


Figure 17. Study area employment distribution, 2006.

SOURCE: PCENSUS 2006.

4.8 REFUGE OPERATIONS

During the 1960s, the headquarters for the Laramie Plains refuges was located in the Wyoming Farm Bureau office in Laramie. The Arapaho NWR was established in 1967, and the headquarters for the Laramie Plains refuges was moved to Arapaho NWR near Walden, Colorado. Since that time, the Laramie Plains refuges have been managed as part of the Arapaho NWR Complex.

Staffing

The Laramie Plains refuges are managed by Service staff headquartered at the Arapaho NWR. Below is a list of the current staff for Arapaho NWR Complex.

<i>Management</i>	Project leader, GS-12
	Refuge operations specialist, GS-11
<i>Biology</i>	Wildlife biologist, GS-9
<i>Administration</i>	Administrative assistant, GS-8
<i>Maintenance</i>	Maintenance worker, WG-8

Facilities

Hutton Lake NWR facilities include a three-door equipment shed in a small enclosure and several other small storage buildings. Bamforth NWR and Mortenson Lake NWR do not have any facilities.



Prairie dog.

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5 Environmental Consequences

This chapter describes the environmental consequences for the management alternatives (see chapter 3) considered for the Laramie Plains refuges.

The planning team assessed the environmental consequences of implementing each alternative on the biological, physical, social, economical, cultural, and historical resources of the refuges.

This chapter contains descriptions of the (1) effects common to alternatives, (2) consequences by alternative, and (3) cumulative impacts of the alternatives. Table 2 in chapter 3 includes a summary of these consequences in relation to the actions for each alternative.

5.1 EFFECTS COMMON TO ALL ALTERNATIVES

Some projected effects would be similar for all alternatives.

- The implementation of any alternative would follow the Service's best management practices.
- The alternatives would minimize impacts to federally threatened and endangered species, to the extent possible and practicable.
- The refuges' staff, contractors, researchers, and other consultants would continue to acquire all applicable permits, for example, for future construction activities.

The sections below describe other projected effects common to all alternatives.

Cultural Resources

As a whole, cultural resources would be enhanced through protecting existing resources and extending such protections to newly discovered cultural resources.

Cultural resource surveys at the refuges have been limited. Therefore, additional surveys would be required prior to any new construction or excavation to fully satisfy provisions of NEPA and applicable acts and policies related to historical and archaeological resources.

Potentially negative effects from construction of trails or facilities would require review by the

regional archaeologist (region 6) and consultation with the Wyoming State Historic Preservation Office.

Environmental Justice

None of the management alternatives described in this EA would disproportionately place any adverse environmental, economic, social, or health effects on minority or low-income populations.

Implementation of any action alternative that includes visitor services and environmental education is anticipated to benefit minority and low-income citizens living near the Laramie Plains refuges by stimulating the economy and creating jobs.

Air Quality

No adverse effects on air quality are expected. Short-term effects on air quality from prescribed burning on the refuges should not vary significantly between any of the alternatives. Prescribed burning operations are planned to reduce impacts to neighbors through ignitions that move the smoke up and out of the vicinity quickly. Rapid mop-up is completed to reduce overnight impacts to neighbors.

Global Warming

The actions proposed in this draft CCP and EA would conserve or restore land and habitat, thus retaining existing carbon sequestration at the refuges. This action would contribute positively to efforts to mitigate human-induced global climate change.

The use of prescribed fire, which releases CO₂, would result in no net loss of carbon because new vegetation would quickly replace the burned-up biomass. Overall, there should be little or no net change for carbon sequestered at the refuges from any of the management alternatives. As it relates to global climate change, the documentation of long-term changes in vegetation, species, and hydrology is an important part of research and monitoring. Adjustments in management may be necessary over time to adapt to a changing climate.

Soils

All alternatives would positively affect soil formation processes on the refuge lands. Some

disturbances to surface soils and topography would occur at those locations selected for: (1) administrative, maintenance, and visitor facilities; (2) introduced and invasive species removal and eradication; and (3) restoration of native habitat.

Water Quality, Wetlands, and Floodplains

All alternatives would positively affect water quality. Positive effects are anticipated from protecting groundwater recharge, preventing runoff, retaining sediment, and minimizing nonpoint source pollution. The management alternatives are not anticipated to have any adverse effects on the area's wetlands and floodplains, pursuant to EO 11990 and EO 11988.

Public Health and Safety

Based on the nature of each alternative, the location of the refuges, and current land use, all alternatives are anticipated to have no significant negative effects on the quality of the human environment, including public health and safety.

Socioeconomics

Bamforth NWR and Mortenson Lake NWR will remain closed to public use under all three management alternatives; therefore, no significant negative effects on the socioeconomics of the study area would occur as a result of the CCP.

Economic Impacts

Laramie Plains refuges staff have indicated that few, if any, refuge visitors come from outside the study area, thus the Laramie Plains refuges have little economic impact on the region. None of the management alternatives under consideration would substantially alter the visitation profile of the refuge. The economic impacts of any of the management alternatives under consideration would likely be outweighed by regional and national economic influences.

5.2 DESCRIPTION OF CONSEQUENCES BY ALTERNATIVE

Management actions are prescribed by alternative as the means for responding to problems and issues raised by Service managers, the public, and governmental partners. Because management would differ for each alternative, the environmental and social effects resulting from implementation would likely differ as well.

The following section provides an analysis of the effects estimated to result from alternative A

(no action), alternative B (proposed action), and alternative C. A summary of this narrative is contained in table 2 in chapter 3.

Alternative A—No Action

The estimated potential effects of alternative A are described by the major topics discussed throughout this document.

Upland Habitat Management

The current level of habitat management would be maintained at approximately the same intensity with the same resources (staff and funding). In addition, the scarce attention given to the refuges may cause currently good habitat conditions on the refuges to experience degradation over time (such as invasive plant overruns).

Poor fencing and a lack of adequate water supplies would not allow proper management of the grazing program to meet management objectives. A continued lack of knowledge regarding upland habitat conditions may result in negative grazing impacts to habitat and wildlife.

Because of a scarcity of resources to perform outreach in neighboring communities, management actions the Service needs to perform (prescribed fire, grazing, haying, and mowing) may be misunderstood by some, which could lead to a lack of support for these and other important habitat management tools.

Native plant abundance and diversity would continue to decline. Introduced cool-season grasses would continue to gradually increase.

Wetlands and Alkali Flats Habitat Management

Wetland habitats continue to be dependent on natural processes. No managed drawdown of wetlands and little movement of water between impoundments would result in the degradation of wetland habitats over time and likely adversely affect the health and size of the migratory bird populations and resident wildlife populations dependent on these habitats, although a decline has not been evident during annual bird surveys by refuge staff.

In drought years and years with little runoff wetland water levels would remain low, creating shallow water on large mud flats, which may benefit shorebirds during their migration.

Many wetland units would lack capacity to provide the full spectrum of wetland conditions, including dry marsh, densely vegetated marsh (regenerative phase), hemi-marsh, open marsh (degenerative phase), and open water.

Wetland soils would be infrequently oxidized, resulting in the rare germination of important annual plants that provide food sources for wetland-dependent migratory birds.

Water Rights

Wetland conditions and wildlife habitat would be dependent on existing minimal water rights. The Service would have an inadequate understanding of water rights held or needed by the refuges to achieve its vision and goals. The Service would have minimal knowledge of Mortenson Lake NWR water quality and the impacts on the Wyoming toad.

Threatened and Endangered Species

The Wyoming toad population has steadily declined at Mortenson Lake since the inception of the refuge in 1993. Though reasons for the decline are unknown, it has been attributed to a number of causes ranging from disease to habitat management to past refuge management.

For the first two years, grazing occurred on the entire pasture encompassing Mortenson Lake. In 1994, an electric fence was erected to protect areas considered to be prime Wyoming toad habitat and to concentrate cattle in the more alkali/bulrush vegetation along the lake to thin the vegetation for the toads. All grazing occurred in the fall after the toads had gone underground to hibernate, and water levels in Mortenson Lake were held at a high level from the spring through the fall.

The Wyoming Toad Recovery Team believes these management strategies may have contributed to the toad population decline. As a result, in 2005 the Service changed its management activities at the refuges in an effort to mimic the habitat conditions existing when the toads were first discovered at Mortenson Lake in 1987. These prerefuge management treatments included grazing around Mortenson Lake in the summer to early fall. In addition, Mortenson Lake was drawn down 1 foot each spring to simulate the historical irrigation practices of the previous landowner. A new management tool (prescribed fire) was also used on the north shore of Mortenson Lake in the spring of 2004 to reduce the heavy rush and carex vegetation. Currently, it is not known if these new management practices have had an impact on the Wyoming toad population.

Habitat Protection

The lost opportunity to protect the large wetland complex adjacent to Hutton Lake NWR could cause valuable wildlife habitats to be subjected to land degradation. Valuable wildlife habitats could be subjected to land degradation due to the failure to increase habitat protection for Wyoming toad at Mortenson Lake NWR.

Invasive Species

Continued reactionary management (occurring only after problems are well established) of invasive species could lead to the degradation of some habitats as invasive plants overtake desirable vegetation before detection. Monitoring of invasive plant areas would hasten the response time for treatment. Quick treatment of known infestations would help restore native vegetation and protect adjacent noninfested areas.

Public Use

Because there would be no change in the visitor services' programs and infrastructure, the consequences would be neutral. Hunting and fishing would continue to occur on other public and private lands in the area. Lack of regulatory information about appropriate refuge uses could increase the potential for negative impacts due to uncontrolled access and minimal law enforcement. The refuges would continue to provide minimal environmental education opportunities for the Laramie community.

Research and Science

The limited research and biological monitoring conducted on the refuges would likely be of minimal value to refuge management activities. As a result, refuge staff would have little ability to implement science-based management or defend management actions.

Cultural Resources

Existing cultural resources are protected; protection would be extended to newly discovered resources.

Partnerships

It would be unlikely that the refuges could meet the vision and goals of the Laramie Plains refuges because there would be no increase in partnerships.

The refuges would continue to use existing water rights and receive water from partners when available.

Refuge Operations

Management activities conducted on the refuges remains minimal and reactionary, which may result in some degradation of habitats due to invasive plant encroachment. Current levels of law enforcement would likely lead to inadequate protection of resources and wildlife.

Socioeconomics

Socioeconomic consequences in the local communities would be neutral or minimal, with refuge expenditures and public visitation remaining

near current levels. The lack of information on visitation and public use would limit the refuges efforts for outreach to generate public support for conservation of wildlife and habitats on the refuges.

Alternative B—Proposed Action

The estimated potential effects of alternative B are described by the major topics discussed throughout this document.

Upland Habitat Management

Alternative B would increase the level of upland habitat management on the refuges. Evaluation of current upland habitat conditions would yield data to determine appropriate grazing program for the benefit of migratory bird species. Grasslands would be managed using prescribed fire, grazing, haying, and mowing. Grassland-dependent migratory and resident species would likely experience population increases with additional nesting, breeding, and foraging areas available.

Fire and grazing disturbances would approximate historical frequency, timing, and intensity. Associated nutrient cycles would largely be restored.

The relatively arid soil surface environment would be less hospitable to introduced plant species, and the plant community would become increasingly dominated by native herbaceous species.

The diversity and abundance of species that use grassland would increase.

Wetlands and Alkali Flats Habitat Management

Wetland habitat conditions would be improved to benefit wildlife resources. Wetland management would maintain wetlands in an early successional stage that is dominated by seed-producing annual wetland species and would include a combination of water storage, drawdowns, vegetation removal, prescribed fire, grazing, haying, and mowing.

The capacity to provide the full spectrum of wetland conditions would increase. All phases would be represented, including dry marsh, densely vegetated marsh (regenerative phase), hemi-marsh, open marsh (degenerative phase), and open water.

Wildlife diversity would increase with more diverse wetland conditions.

Water Rights

Refuge habitats could be improved with the acquisition of additional water rights, resulting in increased irrigation of refuge meadows and uplands, potentially less alkalinity in refuge wetlands, and active management of water levels in wetlands.

Increased knowledge of refuge water quality and its impacts on the Wyoming toad would result in population recovery goals for the Wyoming toad being achieved quicker.

Threatened and Endangered Species

Increases in management intensity and coordination with the Recovery Team and partners would increase the occurrence and abundance of the Wyoming toad species. Population recovery goals for the Wyoming toad would be achieved quicker.

Habitat Protection

Long-term protection of wetland complex would expand nesting and foraging areas for waterfowl and other migratory birds. Buffer zones would increase habitat protection for the Wyoming toad.

Invasive Species

Active management would increase monitoring of invasive species and decrease their occurrence. Target levels for invasive plants would be identified and invasive plants would be reduced to those levels.

Public Use

Alternative B would enhance opportunities for public use at Hutton Lake NWR. Additional hiking and interpretive trails, viewing blinds, and information kiosks would enhance the visitor experience. Improved signage would help visitors learn about the refuge and increase public awareness of natural resource ecology and refuge management.

Research and Science

Knowledge of refuge resources would be enhanced through data collection. The resulting research and monitoring would enable adaptive resource management and direct management activities.

Cultural Resources

Through increased management activities, and expanded and enhanced partnerships, the refuges would benefit from obtaining more data about cultural resources. The public would benefit from increased identification and protection of previously unknown cultural resources on the refuges.

Partnerships

Partnerships augment refuge staff ability to understand and manage refuge resources. Partnerships would increase public awareness and involvement in most aspects of refuge management activities. Vandalism would likely decrease as more people become involved in overseeing the refuges.

Local communities would have a better understanding of the local and national benefits of national wildlife refuges, which could lead to new and expanded partnership opportunities to conserve the natural resources of the Laramie Basin.

Refuge Operations

Dedicating (assigning) refuge staff to manage the Laramie Plains refuges would result in active management of the refuges' resources. Active management would improve wildlife habitat, enhance wildlife-dependent recreation opportunities, cultivate partnerships, and promote research and science to help direct management activities on the refuges.

Socioeconomics

Under Alternative B, the refuges would be managed to enhance wildlife habitat. An increase in the diversity and population of wildlife may increase the visitation of wildlife enthusiasts to Hutton Lake NWR, resulting in minor economic benefit to the Laramie community.

Alternative C

The estimated potential effects of alternative C are described by the major topics discussed throughout this document.

Upland Habitat Management

Evaluating current upland habitat conditions would yield data to determine an appropriate grazing program for the benefit of migratory bird species, but success would be dependent on viable partnerships.

Wetlands and Alkali Flats Habitat Management

Alternative C would improve wetland conditions to benefit wildlife resources, but success would be dependent on viable partnerships. Increased knowledge of refuge water quality and its impacts on the Wyoming toad would result in population recovery goals for the Wyoming toad being achieved quicker.

Water Rights

Refuge habitats could be improved with the acquisition of additional water rights, resulting in increased irrigation of refuge meadows and uplands, potentially less alkalinity in refuge wetlands, and active management of water levels in wetlands, but success would be dependent on viable partnerships.

Threatened and Endangered Species

Increases in management intensity and coordination

with the Recovery Team and partners would increase the occurrence and abundance of the Wyoming toad species. Population recovery goals for the Wyoming toad would be achieved quicker, but success would be dependent on viable partnerships.

Habitat Protection

Long-term protection of wetland complexes would expand nesting and foraging areas for waterfowl and other migratory birds, but success would be dependent on viable partnerships. Buffer zones may increase habitat protection for Wyoming toad, but increased protection would be dependent on viable partnerships.

Invasive Species

Active management would increase monitoring of invasive species and decrease their occurrence. Target levels for invasive plants would be identified and invasive plants would be reduced to those levels, but success would be dependent on viable partnerships.

Public Use

Alternative C would increase and enhance opportunities for wildlife-dependent recreation at Hutton Lake NWR. Additional hiking and interpretive trails, viewing blinds, and information kiosks would enhance the visitor experience. Improved signage would help visitors learn about the refuge and increase public awareness of natural resource ecology and refuge management, but enhanced opportunities for wildlife-dependent recreation would be dependent on viable partnerships.

Research and Science

Knowledge of refuge resources would be enhanced through data collection. The resulting research and monitoring would enable adaptive resource management and direct management activities, but success would be dependent on viable partnerships.

Cultural Resources

Through increased management activities and expanded and enhanced partnerships the refuges would benefit from obtaining more data about cultural resources, but success would be dependent on viable partnerships. The public would benefit from increased identification and protection of previously unknown cultural resources on the refuges.

Partnerships

Partnerships augment refuge staff ability to understand and manage refuge resources.

Partnerships would increase public awareness and involvement in all aspects on refuge management activities. Vandalism would decrease as more people take ownership of the refuges.

Local communities would have a better understanding of the local and national benefits of national wildlife refuges. This could lead to new and expanded partnership opportunities to conserve the natural resources of the basin.

Refuge Operations

Dedicating (assigning) refuge staff to manage the Laramie Plains refuges would result in active management of the refuges' resources. Active management would improve wildlife habitat, enhance wildlife-dependent recreation opportunities, cultivate partnerships, and promote research and science to help direct management activities on the refuges.

Socioeconomics

Under Alternative C, partnerships would become a priority for the refuges. Through these partnerships, the Hutton Lake NWR could improve wildlife habitat and populations, thereby slightly increasing wildlife-enthusiast visitations to the refuge. Visitation increases to the refuges could offer some economic benefit to the Laramie community.

5.3 CUMULATIVE IMPACTS

Cumulative impacts are the potential effects of each alternative in combination with past, present, and future actions. NEPA regulations define cumulative effects as “the impact on the environment which results from the incremental impact of the actions when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant actions taking place over time.” (40 CFR 1508.7)

The cumulative effects analysis for this project is based on reasonably foreseeable future actions that, if carried out, would contribute to the effects of the alternatives. No reasonably foreseeable actions are anticipated. Impacts will be monitored during the implementation of the final CCP. Implementation over an extended period will reduce the likelihood of negative cumulative impacts.

The NEPA requires mitigation measures when the environmental analysis process detects possible significant impacts to habitats, wildlife, or the human environment. All activities proposed under alternative B are not expected or intended to produce significant levels of environmental impacts that would require mitigation measures. Nevertheless, the final CCP will contain the following measures to preclude significant environmental impacts from occurring:

- Federally listed species will be protected from intentional or unintentional impacts by having activities banned or restricted where these species occur.
- All proposed activities will be regulated to reduce potential impacts to wildlife and plant species, especially during their sensitive reproductive cycles.
- Monitoring protocols will be established to determine goal achievement levels and possible unforeseen impacts to resources for application of adaptive management to ensure wildlife and habitat resources, as well as cultural resources, are preserved.
- The final CCP can be revised and amended after 5 years of implementation, for application of adaptive management to correct unforeseen impacts that occur during the first years of the plan.

6 Implementation of the Proposed Action (Draft CCP)

Once a management alternative has been selected and finalized, the CCP has been approved, and the Service has notified the public of its decision, the implementation phase of the CCP process begins.

During the next 15 years (2007–2022), the objectives and strategies presented below would be realized. The final CCP will serve as the primary management document for the Laramie Plains refuges until it is formally revised. The Service will carry out the final CCP with assistance from existing and new partner agencies and organizations, and the public.

Although a number of needs were identified during the planning process, there are no assurances that projects identified in this draft CCP will be fully or even partially funded. However, within every planning effort, there are opportunities to examine current funding and resources to determine the best available uses based on a comprehensive evaluation of critical needs. If this CCP were never completed, issues could go unresolved due to a lack of public and administrative understanding and support.

6.1 IDENTIFICATION OF THE PROPOSED ACTION (DRAFT CCP)

The planning team for the Laramie Plains refuges developed three unique management alternatives based on the issues, concerns, and opportunities expressed during the scoping process (see chapter 1). The issues discussed throughout this draft CCP and EA were derived from the collective input of local citizens and communities, cooperating agencies, conservation organizations, and refuge staff.

In identifying the alternative for proposed action, the team determined probable effects of each alternative on ten program areas: (1) refuge habitats; (2) threatened and endangered species; (3) water rights; (4) habitat protection; (5) invasive species; (6) public use; (7) research and science; (8) cultural resources; (9) partnerships; (10) budget and staffing. Effects on habitats and threatened and endangered species received stronger consideration than effects projected for other program areas. Below is a brief description of the determination of the proposed action alternative, as well as the other two alternatives, in ranked order of desirability.

1. Alternative B—Proposed Action, Draft CCP

Alternative B is ranked the first of three alternatives as the proposed action (draft CCP) for best addressing the vision and goals for the Laramie Plains refuges. The proposed action is fully developed under “Draft CCP” for each refuge later in this chapter.

This alternative would increase management activities on the refuges. Refuge habitats would be actively managed to achieve the goals and objectives identified for the refuges. Refuge staff would strive to better understand the effects of management actions on the refuges. An emphasis on adaptive management, including monitoring the effects of habitat management practices and use of the research results to direct ongoing management, would be a priority.

Research activities for habitat and wildlife would be expanded to evaluate the effects of management activities on species diversity and habitat conditions. Refuge staff would conduct biological monitoring on the refuges and facilitate applied research to direct management decisions. Refuge staff would partner with universities and other entities to conduct specific research to identify refuge resources and obtain a better understanding of the effects of management activities.

Refuge upland habitats would be evaluated to determine appropriate grazing programs to achieve refuge goals. Boundary fencing would be installed and maintained to permit active management of the grazing programs. Prescribed fire would be used, as appropriate, to (1) reduce hazardous fuels, (2) reintroduce fire to ecosystems that evolved with fire as a disturbance factor, and (3) improve habitat for selected species.

Wetlands management would use existing water rights and other management treatments (prescribed fire, grazing, haying, and mowing) to benefit migratory birds and resident wildlife. Management efforts would be expanded to benefit species of conservation concern. Refuge staff would research the availability of additional water rights for the refuges, and consider obtaining additional water rights where appropriate for the benefit of wetland-dependent wildlife.

Monitoring and management of invasive species on the refuges would be increased. Greater emphasis would be placed on maintaining existing partnerships and developing new partnerships to achieve the goals and objectives of the refuges. Cultural resources management would protect known and newly discovered artifacts and sites.

2. Alternative C—Partnerships

Alternative C ranked second of three alternatives as the proposed action. This alternative ranked below the proposed action, alternative B, because success in achieving refuge goals and objectives is dependent upon the development and maintenance of viable partnerships where success and prediction of outcomes do not lie within the control of the Service.

The development and maintenance of successful partnerships requires intensive, focused efforts on behalf of all members of the partnership. As funding and priorities of cooperating agencies vary over time, the ability to achieve refuge goals and objectives may change. Because funding and priorities of cooperating partners lies outside the control of the Service, this alternative was viewed as ranking lower in ability to address the vision and goals of the Laramie Plains refuges than the proposed action.

3. Alternative A—Current Management

Alternative A ranked last of three alternatives because management issues would not be adequately addressed.

The CCP process offers an opportunity for the Laramie Plains refuges to assess effects of past and current management. This timely and introspective analysis encouraged development, consideration, and selection of alternatives to current management that better address old and emerging management issues.

6.2 SUMMARY OF THE PROPOSED ACTION

For the past 40 years, the Laramie plains national wildlife refuges have received little to no active management due to the relatively small staff of the Arapaho NWR Complex and competing refuge priorities. Bird surveys are conducted and boundary fences and signs are maintained, but little to no proactive management, monitoring, or other activities have occurred.

Using data and information from other wetland-complex areas, some biological goals have been established for these refuges. Future studies may indicate whether these goals are appropriate or

need to be revised. It is hoped that this plan will demonstrate the need to actively manage these refuges for the benefit of migratory bird species. An increase of one FTE, dedicated to the Laramie Plains refuges and Pathfinder NWR (located 50 miles southwest of Casper, Wyoming), would have a noticeable impact on the ability to conduct site-specific research; build and maintain partnerships; develop specific biologically based, goal-oriented, step-down habitat management plans; and guide future management direction for these stations.

The planning team developed objectives in support of goals identified in chapter 2 to carry out the proposed action (alternative B) for management of the Laramie Plains refuges. Strategies to achieve objectives are suggested. Rationale is included that supports goals, objectives, and strategies. In addition, assumptions are discussed.

Biological goals and objectives emphasize management of plant communities as habitat for wildlife, especially migratory birds, and are organized by major habitat types represented at the three refuges. Goals and objectives are habitat based rather than wildlife based, because wildlife often respond to factors beyond the control of local refuge management (for example, disease outbreaks or habitat conditions on important staging or wintering sites can affect populations of migratory birds). Furthermore, management practices (for example, prescribed fire, grazing, and water-level manipulation) usually benefit plant communities rather than wildlife populations. Habitat-based objectives emphasize monitoring of important vegetation attributes such as community composition and vegetation structure over time. In most cases, wildlife population responses to habitat changes are not monitored. Rather, site-specific inventories, applied research, and literature reviews allow for reasonable predictions of wildlife response to habitat management.

Additional goals, objectives, and strategies are developed for visitor services, cultural resources, research and science, and refuge operations.

The National Wildlife Refuge system Administration Act of 1966 required the Secretary of the Interior, before permitting uses, to ensure that those uses are compatible with the purposes of the refuge. The CCP process requires a compatibility determination for all existing and proposed refuge uses. Draft compatibility determinations for the Laramie Plains national wildlife include wildlife observation and wildlife photography (appendix J), environmental education and interpretation (appendix K), and prescribed grazing (appendix L).

Management direction to achieve the vision for the Laramie Plains refuges is presented first for goals, objectives, and strategies shared by all three refuges —Bamforth NWR, Hutton Lake NWR, and

Mortenson Lake NWR—followed by refuge-specific goals, objectives, and strategies for:

- Bamforth NWR
- Hutton Lake NWR
- Mortenson Lake NWR

6.3 DRAFT CCP

Draft CCP—Bamforth NWR, Hutton Lake NWR, and Mortenson Lake NWR

The following goals, objectives, and strategies apply to all three Laramie Plains refuges and outline the actions needed to achieve the vision of the refuges.

Research and Science Goal

Conduct natural resource management using sound science and applied research to advance the understanding of natural resource function.

Objective 1

Within 2 years, identify and prioritize biological monitoring needs to meet the refuges' goals and objectives. Expand research activities for habitat and wildlife to evaluate the effects of management activities on species diversity and habitat conditions. Conduct applied research to direct management decisions.

Strategies

- Identify and prioritize habitat management research needs.
- Conduct research in collaboration with others on priority needs.
- Encourage research that focuses on the refuges' habitat management goals.
- In cooperation with others, develop step-down management plans.
- Refuge staff partner with universities and other entities to conduct specific research to identify refuge resources and obtain a better understanding of the effects of management activities.

Rationale and Assumptions

The lack of active management has resulted in sparse biological information regarding these

refuges. It will be important to prioritize and plan active and long-term research programs to gather biological data.

Objective 2

Within 6 years, actively utilize research data to guide management decision making.

Strategies

- Initiate highest-priority studies to enable time to conduct studies and evaluate data.
- Reach out to partners and others to conduct research in highest-need areas.
- Apply for grants, Science Support Program funding, and other funding initiatives to fund applicable research.

Rationale and Assumptions

Research will focus on providing baseline data and achieving identified habitat goals. Projects would be evaluated and limited to those that will answer questions needed for improved refuge management. The scope and impacts of individual and cumulative research projects would be evaluated to ensure minimal disturbance to wildlife. Projects may be delayed or denied if wildlife or habitat impacts were determined to be too great.

Partnerships Goal

Work with partners to determine the wildlife and habitat resources on the refuges, to maximize wildlife habitat protection, and to increase understanding of wildlife needs, as well as the benefits wildlife offer to individuals and communities, on and off the refuges.

Objective 1

Throughout the life of this plan, promote existing partnerships and develop new partnerships to achieve refuge goals and objectives.

Strategies

- Engage in partnerships that result in collecting baseline data for the refuges.
- Work with partners to evaluate mineral holdings, and where applicable, gain mineral rights to protect surface habitats.
- Work with partners to evaluate water rights, and where applicable, gain additional water rights to benefit refuge management for migratory bird species.

Rationale and Assumptions

Partnerships are important to the Service to achieve refuge management goals and objectives. If the Service does not cultivate partnerships, which take time and resources to develop and maintain, opportunities to work with others in conserving wildlife habitat will be missed.

Current partnerships include Albany County Weed and Pest, local landowners, and Wyoming Audubon. Efforts would be increased to focus research-based partnerships on collecting baseline data for the refuges.

Cultural Resources Goal

Identify and protect cultural resources on the refuges.

Objective 1

Within the 15-year life of this plan, accomplish a complete cultural resources survey.

Strategy

- Conduct a cultural resources survey on the refuges. Document, map, and protect any resources found. Coordinate protection on a case-by-case basis with the regional archeologist.

Rationale and Assumptions

After consulting with the regional archeologist, the Service determined a comprehensive survey could be scheduled and completed within the life of this plan, which would provide important information regarding any cultural resources at these refuges and help guide project management. Cultural resource program priorities include Section 106 reviews to ensure historic sites are evaluated and protected. Any project that could affect structures older than 50 years or disturb the ground should go through this review process. A second concern is identifying sensitive areas, which would help staff and law enforcement protect these resources from vandalism or theft.

Secondary goals include conducting comprehensive reviews to assist in long-term refuge project planning, interviewing locals and long-term staff, and protecting historic records and information when alteration or removal of historic structures is required.

Refuge Operations Goal

Secure and demonstrate the effective use of funding, staffing, and partnerships for the benefit of all resources in support of the refuges and the Refuge System.

Objective 1

Within 2 years of plan approval, hire and assign to the Laramie Plains refuges and Pathfinder NWR one full-time Service employee to perform increased management activities on the refuge.

Strategies

- Hire a refuge manager or refuge operations specialist and assign to the Laramie Plains refuges and Pathfinder NWR.
- Increase funding to improve management activities at the refuges.

Rationale and Assumptions

The Laramie Plains refuges are administratively managed by the Arapaho NWR Complex. The complex includes Arapaho NWR, Bamforth NWR, Hutton Lake NWR, Mortenson Lake NWR, and Pathfinder NWR. The current staffing of the complex precludes a dedicated staff member for the three Laramie refuges, which has resulted in minimal management at these refuges.

The Laramie Plains refuges were managed by Service staff headquartered in Laramie until the Arapaho NWR was established in 1967, when headquarters and priorities shifted to Walden, Colorado. Since that time, management of the Wyoming refuges has been minimal.

Through discussions, the planning team determined that the addition of one full-time Service member assigned to the Laramie Plains refuges and Pathfinder NWR would provide adequate staff to actively manage the lands. Refuge management activities would be increased and enhanced, and refuge staff would strive to better understand the effects of management actions on the refuges. An emphasis on adaptive management, including monitoring the effects of habitat management practices and using research results to direct ongoing management, would be a priority.

Draft CCP—Bamforth NWR

The following goals, objectives, and strategies for Bamforth NWR outline the actions needed to achieve the vision of the Laramie Plains refuges.

Natural Resources Goal

Conduct baseline surveys to identify refuge resources and the role these resources serve in the Laramie Plains ecosystem and the Refuge System.

Objective 1

Within 5 years, identify and prioritize biological monitoring needs and gather baseline data to

evaluate refuge management needs. Conduct applied research to direct management decisions.

Strategies

- Identify and prioritize habitat management research needs.
- Conduct research in collaboration with others on priority needs.
- Encourage research that focuses on developing plans for the future of this refuge.
- In cooperation with others, evaluate the role Bamforth NWR plays in the Refuge System.

Rationale and Assumptions

The Laramie Plains refuges are primarily native grasslands. The decline of grassland nesting birds has been attributed to habitat loss and conversion, fragmentation, and the disruption of ecological factors, such as fire, which created a mosaic of habitat types across the landscape. As a result, many grassland bird species are now considered species of biological concern (USFWS 2002). Managing natural areas for these bird species involves providing the nesting habitat requirements and food resources essential for their reproduction and survival. These requirements include large, treeless patches containing within them diversity in vegetation structure.

Though these and other birds have been identified in the area, the Service has no data on the effects of current grazing, condition of uplands, or other biological information due to inactive management. The lack of site-specific biological information on these species' use of refuge lands and personnel dedicated to guide management practices (grazing, rest, prescribed fire) needs to be corrected by gathering data and evaluating management practices (grazing, rest, prescribed fire) for the benefits they offer to wildlife resources. Baseline information on vegetative structure, composition and quality as well as water quality are imperative to guide proper management decisions.



Bobolink

USFWS

Objective 2

Within 6 years of hiring an FTE assigned to Arapaho NWR but responsible for managing the Laramie Plains refuges and the Pathfinder NWR, actively use research data to guide management decision making.

Strategies

- Initiate highest-priority studies to enable time to conduct studies and evaluate data.
- Reach out to partners and others to conduct research in highest-need areas.
- Apply for grants, Science Support Program funding, and other funding initiatives to fund applicable research.

Rationale and Assumptions

A lack of information is hampering management direction. Detailed step-down plans will be developed and implemented as information is gathered. Projects will be evaluated and limited to those that will effectively address the need for improved refuge management. The scope and impacts of individual and cumulative research projects will be evaluated to ensure minimal disturbance to wildlife. Projects may be delayed or denied if wildlife or habitat impacts were determined to be too great.

Draft CCP—Hutton Lake NWR

The following goals, objectives, and strategies for Hutton Lake NWR outline the actions needed to achieve the vision of the Laramie Plains refuges.

Wetlands Goal

Manage refuge impoundments and other wetlands to create diverse habitat for wetland-dependent wildlife.

Objective 1

Over a 5-year average, manage Rush Lake at approximately 60–80 percent emergent vegetation and 20–40 percent open water during the waterfowl breeding season (May–June) for the benefit of colonial nesting birds (white-faced ibis, black-crowned night-herons), as well as other emergent-dependent species (yellow-headed blackbirds, marsh wrens, ruddy ducks, Wilson's phalarope).

Strategies

- Graze cattle to stimulate or maintain habitat conditions.

- Use prescribed fire to stimulate or maintain habitat conditions.
- Use mechanical manipulation (mow) to stimulate or maintain habitat conditions.
- Manipulate water (flood and drawdown) to stimulate or maintain habitat conditions.
- Develop vegetative monitoring protocol.

Rationale and Assumptions

Previous research has indicated that wetlands with an approximate 50:50 ratio of open water and emergent vegetation (cattails, bulrushes), often termed “hemi-marshes,” attract the highest densities and diversities of wetland birds (Weller and Spatcher 1965). The Wyoming Partners in Flight, Wyoming Bird Conservation Plan (Nicholoff 2003) notes that depending on the situation, cover: water ratios of 65:35 to 35:65 might be considered optimum as well. A good interspersed vegetation and open water is probably more important than the ratio of the two. Key species of concern on the refuge include white-faced ibis and other birds that require dense emergent cover. White-faced ibis require high amounts of emergent vegetation, such as bulrushes, in their breeding habitat (Dark-Smiley and Keinath 2003).

A habitat model for marsh wrens describes optimum conditions as occurring when there is >80 percent emergent cover (Gutzwiller and Anderson 1987). The emergent vegetation/open water objective for Rush Lake calls for 60–80 percent emergent vegetation to better provide for the habitat needs of the key birds of concern. Wilson’s phalarope will use both fresh and alkali wetlands with three characteristics: open water, emergent vegetation, and open shoreline (Dechant et al. 2001 revised 2003). Though Wilson’s phalarope have been observed, a lack of on-site data concerning water quality and other parameters hamper management actions. From the more freshwater Rush Lake to the more alkaline Lake Creighton, Hutton Lake NWR can provide life-cycle requirements for these bird species, but site-specific information is needed to guide management direction.

Objective 2

Manage Hoge Lake and Lake George to have approximately 70–90 percent open water and 10–30 percent emergent vegetation to benefit migratory birds (lesser scaup, gadwall, black tern) for migration habitat needs and brood rearing.

Strategies

- Graze cattle to stimulate or maintain habitat conditions.
- Use prescribed fire to stimulate or maintain habitat conditions.

Rationale and Assumptions

From the Service’s 1975 “Annual Report” to current day, the lack of good water rights for Hutton Lake NWR and the inability to do more than just fill ponds when possible and watch them evaporate when conditions are dry are constant themes. In the arid Laramie Plains, water is a key resource. Because the Service does not own senior water rights, the refuge wetlands are at the mercy of nature and the generosity of adjoining landowners who hold the rights to the water in Sand Creek. Since the 1980s, the water control structures at Hutton Lake NWR have remained in place with no active water management other than the water commissioner opening or closing the headgate on Sand Creek. From Rush Lake water can flow to Lake George or Hoge Lake, or both. Lake George connects to the largest lake, Creighton Lake, and Hoge Lake connects to Hutton Lake. From Creighton Lake to Hutton Lake the area is a closed basin. The closed basin affects water quality, with Creighton Lake exhibiting some alkali characteristics such as white sediments ringing the dry lakeshore. For these reasons, Hutton Lake NWR is primarily an important resting area for migratory birds and a brood-rearing area of local importance.

A habitat model for lesser scaup notes that broods tend to use expansive areas of open water as security and escape cover, and highly suitable conditions are described as having large amounts of open water and as little as 0–50 percent emergent cover (Allen 1986). Wilson’s phalarope will use both fresh and alkali wetlands with three characteristics: open water, emergent vegetation, and open shoreline (Dechant et al. 2001 revised 2003). Though Wilson’s phalarope have been observed, a lack of data concerning water quality and other parameters hamper management actions. From the more freshwater Rush Lake to the more alkaline Lake Creighton, Hutton Lake NWR can provide life-cycle requirements for these bird species, but site-specific information is needed to guide management direction.

During the postbreeding season, gadwalls are found with diving ducks in deeper water habitats; northern shovelers prefer more open permanent water bodies (Murkin et al. 1997). Ruddy ducks’ fall habitat use patterns show a preference for deeper, more open habitats, as they require large open areas to become airborne. Open lake marshes serve as roosting sites during migration for a wide range of species.

Objective 3

Inspect impoundments annually for tamarisk and eradicate any plants found as part of the effort for a zero tolerance of this invasive species on the refuge.

Strategies

- Improve and rehabilitate water control structures on all wetlands.
- Continue to partner with Albany County Weed and Pest for monitoring and control of invasive species.

Rationale and Assumptions

Tamarisk, in low concentrations, has been found on the refuge in Hoge Lake. Plants have been pulled or sprayed in cooperation with Albany County Weed and Pest. The county surveys the refuge and controls tamarisk annually, and found plants are either pulled or sprayed with herbicides.

Tamarisk effectively displaces native vegetation through competition for available resources and germination sites, while offering little suitable habitat for native wildlife (Sudbrock 1993). It has little value to native wildlife and displaces native vegetation where the value of the original habitat is progressively diminished for many native animal species (Lovich 1996).

Uplands Goal

Evaluate shrub- and grass-dominated uplands for the benefit of migratory birds (willet, horned lark), white-tailed prairie dogs, pronghorn, and other wildlife.

Objective 1

Within 3 years, initiate baseline inventories to identify flora and fauna species composition and distribution, as well as habitat types and their distribution on the refuge. After initial evaluation, develop quantitative objectives and use, as appropriate and supported by sound science and objectives, potential tools (prescribed fire, grazing, rest, invasive species control).

Strategies

- Partner with U.S. Geological Survey (USGS), the University of Wyoming, and Colorado State University to develop and implement research objectives.
- Explore grants and other funding sources to provide for research needs.

Rationale and Assumptions

The Laramie Plains refuges are primarily native grasslands. The decline of grassland nesting birds has been attributed to habitat loss and conversion, fragmentation, and the disruption of ecological factors, such as fire, which created a mosaic of habitat types across the landscape. As a result, many grassland bird species are now considered species of biological concern (USFWS 2002). Managing natural areas for these bird species involves providing the nesting habitat requirements and food resources essential for their reproduction and survival. These requirements include large, treeless patches containing within them diversity in vegetation structure.

Many shorebirds also use the refuges. Willet, a breeding shorebird common on the refuges, requires large expanses of short, sparse grasslands for nesting and foraging and wetland complexes for foraging (Stewart 1975, Kantrud and Higgins 1992, Dechant et al. 2001). In both upland and wetland habitats, adults with broods use somewhat taller, denser grass cover than do breeding pairs during nesting (Ryan and Renken 1987). Willets also prefer native grass to tame vegetation (Stewart 1975, Kantrud and Higgins 1992, Dechant et al. 2001) and shallow-water wetlands with short, sparse shoreline vegetation. Suitable wetlands range from fresh to saline and vary widely in size and permanence (Dechant et al. 2001).

A common upland bird to the area is the horned lark. In Colorado, horned lark territories in lightly grazed short-grass pastures ranged between 0.13 and 1.5 hectare and averaged 0.7 hectare (Boyd 1976 referenced in Dinkens et al. 2003). Horned larks have been observed, but most surveys of the area have concentrated on wetland areas. A lack of data on upland birds' use of the refuge hampers upland management decisions.

Though these and other birds have been identified in the area, the Service does not have any data on the effects of current grazing, condition of uplands, or other biological information due to a lack of monitoring. The lack of site-specific biological information on these species' use of refuge lands and personnel dedicated to guide management practices (prescribed fire, grazing, haying, and mowing) needs to be corrected by gathering data and evaluating such management practices for the benefits they offer to wildlife resources. Baseline information on vegetative structure, composition, and quality as well as water quality are imperative to guide proper management decisions.

Objective 2

Within 10 years, identify and map invasive plant infestations (other than tamarisk) and initiate control procedures. Determine target percent control following this process.

Strategy

- Continue and improve partnership with Albany County Weed and Pest for noxious weed management using all appropriate known strategies such as chemical, biological, cultural, and mechanical controls.
- Use prescribed fire to reduce and control invasive species.

Rationale and Assumptions

For native birds to be retained, invasive plants must be controlled (Marzluff and Ewing 2001). Invasive species pose a serious threat to existing fish and wildlife resources. Once invasive plants are present, it is important to maximize efforts to gain control of them. Currently, no large infestations occur. Continued monitoring, improved by hiring a dedicated Service employee for the Laramie Plains refuges, will ensure that any noted invasive plants will be mapped and control procedures will be initiated.

Visitor Services Goal

Provide wildlife-dependent recreational opportunities to a diverse audience when the administration of these programs does not adversely affect habitat management objectives.

Objective 1

Within 5 years of plan approval, enhance nonconsumptive wildlife-dependent recreation by developing a visitor services plan and supporting facilities to address refuge activities, access, and circulation.

Strategies

- Develop visitor services plan.
- Establish a formal parking area with informational kiosks and brochures.
- Provide walk-in access and accessible trails with markers to designate walking trails to the best wildlife viewing areas.
- Close roads where necessary to facilitate implementation of visitor services plan and decrease disturbance to wildlife, discourage illegal hunting, and improve maintenance.
- Update refuge informational brochures and wildlife list to Service standards.

- Construct accessible photography blinds on Lake George and Rush and Hutton lakes.
- Provide educational materials on wildlife photography techniques.
- Provide an annual educational opportunity with experienced wildlife photographers sharing their expertise.

Rationale and Assumptions

The lakes provide wildlife viewing and wildlife photography opportunities. The public can observe and enjoy a variety of wildlife including white-tailed prairie dogs, raptors, waterfowl, shorebirds, and other migratory species.

Currently roads consist mainly of two tracks randomly traversing the refuge in an undefined pattern. Vehicles traveling on the two tracks create new roads and trails when conditions are muddy or when pursuing a wildlife viewing opportunity not near a roadway. Conducting a site circulation assessment and closing refuge roads where needed would reduce law enforcement issues and foster a quiet, quality wildlife-dependent recreational opportunity.

Objective 2

Within 10 years of plan approval, improve wildlife educational opportunities.

Strategies

- In cooperation with University of Wyoming, Wyoming Audubon, and others, offer scheduled environmental education opportunities at Hutton Lake NWR.
- Create programs for students and volunteers to assist in refuge management activities.
- Provide educational opportunities to local youth organizations such as Boy Scouts and Girl Scouts.

Rationale and Assumptions

The public should be made aware of the Refuge System in general and this refuge in particular, as well as the benefits refuges provide to wildlife and the community. The refuge's proximity to Laramie makes it accessible for environmental education opportunities from kindergarten through college.

Draft CCP—Mortenson Lake NWR

The following goals, objectives, and strategies for Mortenson Lake NWR outline the actions needed to achieve the vision of the Laramie Plains refuges.

Wetlands Goal

Following considerations for Wyoming toad needs, manage refuge impoundments and other wetlands to create diverse habitat for wetland-dependent wildlife.

Objective 1

Within 8 years, develop and implement protocols for increased water management and monitoring of water quality on Garber, Soda, and Gibbs lakes for the benefit of migrating waterfowl and for the nesting and feeding benefits of shorebirds and other water-dependent birds.

Strategies

- Work with the USFWS region 6, divisions of water resources and ecological services, to resolve water quality issues.
- Develop an infrastructure improvement plan for dikes, water control structures, and ditches.

Rationale and Assumptions

Soda, Gibbs, and Garber lakes are known to have alkalinity problems, but no specific data for the lakes is available. The ability to manage these lakes' water levels is minimal because infrastructures are lacking.

The potential for the Wyoming toad to use these lakes is also minimal, due to water quality and surrounding vegetation. Potential high alkalinity and the limited vegetation development of Garber and Soda lakes make them unsuitable for the toad. Gibbs Lake is surrounded by short-grass prairie with very little wetland vegetation, which also limits habitat for the toad. Managing these lakes for the Wyoming toad would be the priority if the limitations stated above could be changed in favor of the toad.

Waterfowl, shorebirds, and other water-dependent birds currently use the three lakes, but increased water management (water-level control, flushing water through them) and quality could improve the lakes for a greater benefit to these birds.

Objective 2

Within 5 years, investigate the opportunities for acquiring more water rights and initiate the acquisition on any feasible possibility.

Strategy

- Work with USFWS region 6, division of water resources, to pursue additional water rights and seek adjudication of existing storage rights.

Rationale and Assumptions

Water rights on the refuge are limited, with water sources being runoff from melting snow, natural springs, and water from return flows off land irrigated by the Pioneer ditch. The refuge does not own any A or B shares on the Pioneer ditch (USFWS 1992). A refuge neighbor owns some of these shares and uses them to help the refuge irrigate some lands around Soda Lake. This irrigation water also helps water flow through Soda Lake into Gibbs Lake. The refuge does have storage rights on Soda, Harmon, and Mortenson lakes, but none of the rights are adjudicated. If water rights were available for purchase, the refuge wetlands and irrigation lands would benefit greatly if the Service could acquire them.

Uplands Goal

Following consideration for Wyoming toad needs, manage shrub- and grass-dominated uplands for the benefit of migratory birds, white-tailed prairie dogs, pronghorn, and other wildlife.

Objective 1

Within 3 years, initiate baseline data studies to identify flora and fauna species composition and distribution, as well as habitat types and their distribution on the refuge. Conduct adaptive management over the life of the plan.

Strategies

Same strategies as Hutton Lake NWR Uplands objective 1.

Rationale and Assumptions

Same rationale and assumptions as Hutton Lake NWR Uplands objective 1.

Objective 2

Within 5 years, identify and map invasive plant infestations and initiate control procedures. Determine target percent control following this process.

Strategies

Same strategies as Hutton Lake NWR Uplands objective 2.

Rationale and Assumptions

Same rationale and assumptions as Hutton Lake NWR Uplands objective 2.

Wyoming Toad Goal

In conjunction with the Wyoming Toad Recovery Team, manage refuge lands around Mortenson Lake and other areas, on the refuge, as necessary to protect, create, and manage habitat suitable for Wyoming toad recovery from endangered status.

Objective 1

Maintain 40 percent of the habitat over a 5-year average in the moist margin of Mortenson Lake proper with 35–39 percent horizontal vegetative cover (dominant species: American bulrush and creeping spike, or species with similar morphology) and 20 percent open areas in mosaic conditions for metamorphs and juvenile (<2 year olds) Wyoming toads.

Strategies

- Graze cattle to stimulate or maintain habitat conditions.
- Use prescribed fire to stimulate or maintain habitat conditions.
- Use mechanical manipulation to stimulate or maintain habitat conditions.
- Manipulate water to stimulate habitat conditions.
- Develop vegetative monitoring protocol.

Rationale and Assumptions

Two master's theses (Withers 1992 and Parker 2000), background information, and the Wyoming Toad Recovery Team indicate that the habitat conditions detailed above are beneficial to the growth and survival of the Wyoming toad. Vegetative type and percent cover for metamorphs and juveniles are based on Withers's study, with the lower percentage used more by the metamorphs and the higher percentage used more by the juveniles. The vegetative percentage cover for adults is based on Parker's study. The vegetative cover percentages are based on the habitat as a whole, with each cover fulfilling a part of the habitat for a total of 100 percent. The lake's moist margin is defined as the area of ample soil moisture favored by the Wyoming toad at Mortenson Lake. On a 4-point moisture scale (1 = dry, 2 = moist, 3 = saturated, 4 = standing water), Wyoming toads use moist 2.0 to supersaturated 3.6 soils (Withers 1992).

One report questions Parker's habitat-use data because none of the toads in his study were wild: "The determination of habitat use and preference is fraught with difficulties such as spatial and serial autocorrelation, nonindependence of proportions, and definitions of habitat availability" (Drietz 2006). Parker also questions Withers's claim of habitat cover needs for adult Wyoming toads in an article

in the *Journal of Wildlife Management*. He states that adult toads used habitat with more vegetation cover than was documented in the past (Parker and Anderson 2003).

The objectives for the Wyoming toad are based on the best available science. As new research becomes available, the objectives will change to reflect new data and knowledge.

Objective 2

Maintain 40 percent of the habitat over a 5-year average in the moist margin of Mortenson Lake proper with a mean of 55 percent horizontal vegetative cover (dominant species: American bulrush and creeping spike, or species with similar morphology) and 20 percent open areas in mosaic conditions for adult Wyoming toads.

Strategies

Same as objective 1.

Rationale and Assumptions

Same as objective 1.

Objective 3

Manage water levels on Mortenson Lake to mimic conditions prior to refuge establishment with drawdowns starting in early May. Maintain water levels in late May or early June for egg masses. Prior to initiating another drawdown, conduct surveys for egg masses to determine if hatching has occurred. Once hatching is completed, begin another drawdown and continue to draw down until about mid-July to provide basking areas for adults and shallow warm water for tadpoles.

Strategies

- Conduct egg mass surveys.
- Conduct breeding calling surveys.
- Develop monitoring protocols.
- Monitor water quality.
- Staff gauge for Mortenson Lake.

Rationale and Assumptions

Two master's theses (Withers 1992 and Parker 2000), background information, and the Wyoming Toad Recovery Team indicate that the water level manipulation described above should enhance Wyoming toad habitat. This drawdown effort is an attempt to mimic prerefuge management of Mortenson Lake. The Recovery Team believes that the management practice over the past 15 of years of keeping the lake full throughout the spring and into the summer may be a factor in the perceived decline of Wyoming toads at Mortenson Lake. Prerefuge

water manipulations would create shallow stable water 3.5–6.3 cm deep for egg development, warm shallow water for tadpoles, and eventually dry moist areas for adult toads to bask in (Withers 1992). Draw down of Mortenson Lake would be approximately 1.6 feet over the three month time frame.

Objective 4

Continue to work with the Recovery Team following their recommendations for habitat conditions for the Wyoming toad as new science emerges.

Strategy

- Continue to have a Service staff member participate as a member of the Recovery Team.

Rationale and Assumptions

The Recovery Team is on the forefront of all new science concerning the toad. The team's recommendations will reflect the most up-to-date science and on-the-ground experience.

6.4 STAFFING AND FUNDING

Currently, the Arapaho NWR Complex has a staff of five full-time employees. All five employees work in the complex with duties at Arapaho NWR, the three Laramie Plains refuges, and Pathfinder NWR near Casper, Wyoming. Table 5 lists these positions along with one new position (specifically assigned to the Laramie Plains refuges and Pathfinder NWR) that is needed for full implementation of the CCP. Projects required to carry out the CCP are funded through two separate systems, as follows:

- The refuge operations needs system (RONS) is used to document requests to Congress for funding and staffing needed to carry out projects above the existing base budget.
- The Service asset maintenance management system (SAMMS) is used to document the equipment, buildings, and other existing properties that require repair or replacement.

Monitoring and Evaluation

Adaptive management is a flexible approach to long-term management of biotic resources. Adaptive management is directed, over time, by the results of

ongoing monitoring activities and other information. More specifically, adaptive management is a process by which projects are carried out within a framework of scientifically driven experiments to test the predictions and assumptions outlined with a CCP (figure 18).

To apply adaptive management, specific survey, inventory, and monitoring protocols would be adopted for the Laramie Plains refuges. The habitat management strategies would be systematically evaluated to determine management effects on wildlife populations. This information would be used to refine approaches and determine how effectively the objectives are being accomplished. If monitoring and evaluation indicate undesirable effects for target and nontarget species or communities, the management projects would be altered accordingly. Subsequently, the CCP would be revised.

Specific monitoring and evaluation activities will be described in the step-down management plans (table 6).

Plan Amendment and Revision

The final CCP will be reviewed annually to determine the need for revision. A revision would occur if and when significant information becomes available. The final CCP will be supported by detailed step-down management plans to address the completion of specific strategies in support of the Laramie Plains refuges' goals and objectives. Revisions to the CCP and the step-down management plans will be subject to public review and NEPA compliance.

At a minimum, the final CCP will be evaluated every 5 years and revised after 15 years.

6.5 STEP-DOWN MANAGEMENT PLANS

The CCP for the Laramie Plains refuges is intended to be a broad umbrella plan that (1) outlines general concepts and objectives for habitat, wildlife, visitor services, cultural resources, and partnerships; and (2) guides refuge management for the next 15 years. Step-down management plans provide greater detail for carrying out specific actions authorized by the CCP. Table 5 presents step-down management plans for the refuges that are anticipated to be needed, along with their current status and next revision date.

Table 5. Current and proposed staff for the Arapaho NWR Complex, including Arapaho NWR, Colorado, and Bamforth NWR, Hutton Lake NWR, Mortenson Lake NWR, and Pathfinder NWR, Wyoming.		
	<i>Current Positions</i> <i>GS=General Schedule Positions</i> <i>WG=Wage Grade Positions</i>	<i>Additional Proposed Positions</i> <i>(Unfunded staffing)</i>
Management Staff	Refuge project leader, GS-12* Refuge operations specialist, GS-11*	Refuge operations specialist, GS-9
Biological Staff	Wildlife biologist, GS-9*	<i>No additional positions</i>
Visitor Service Staff	<i>None</i>	<i>None</i>
Administrative Staff	Administrative assistant, GS-8*	<i>No additional positions</i>
Maintenance Staff	Maintenance worker, WG-8*	<i>No additional positions</i>
Law Enforcement Staff	<i>None</i>	<i>None</i>
Fire Management Staff	<i>None</i>	<i>None</i>

*This position supports the Laramie Plains refuges but is assigned to the Arapaho NWR Complex and works at all five stations.

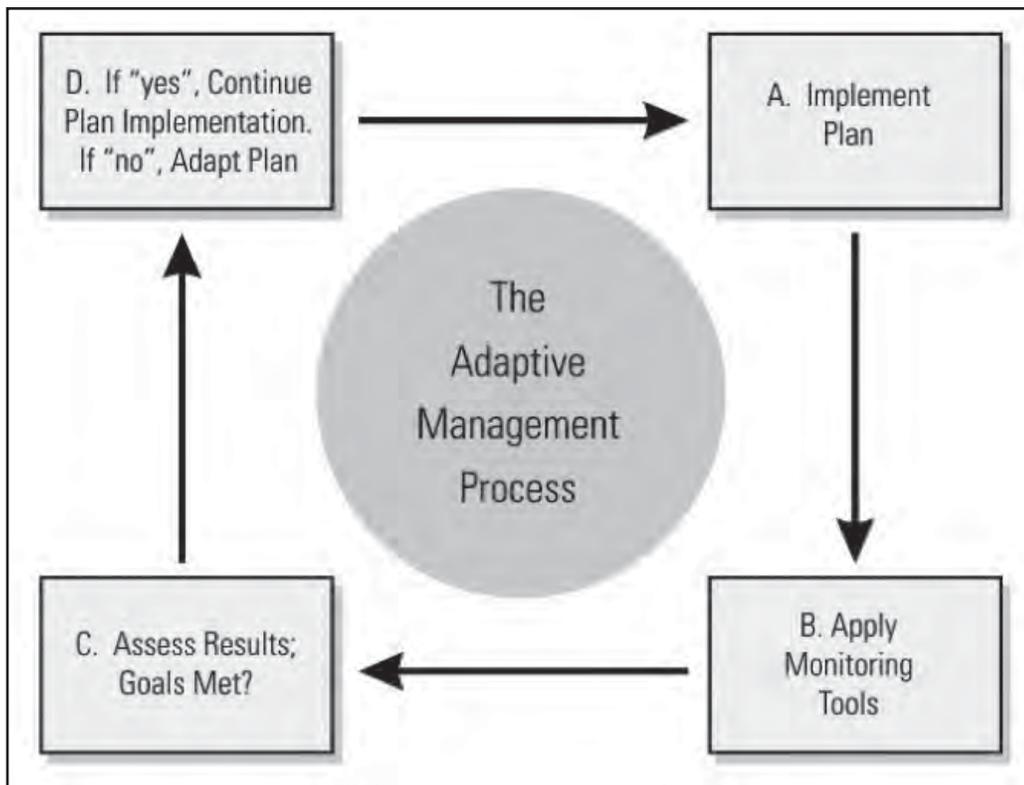


Figure 18. The adaptive management process.

<i>Step-down Management Plan</i>	<i>Completed Plan, Year Approved</i>	<i>New or Revised Plan, Completion Year</i>
Fire management plan	2001	2009
Habitat management plan	—	2012
Habitat management plan (annual)	—	2009
Integrated pest management plan	2007	N/A
Law enforcement plan	—	2017
Safety plan	Under plan for Arapaho NWR Complex	2008
Visitor services plan (applies to Hutton Lake NWR)	—	2010
Water management plan	2007	N/A

Glossary of Terms

accessible—Pertaining to physical access to areas and activities for people of different abilities, especially those with physical impairments.

adaptive resource management—The rigorous application of management, research, and monitoring to gain information and experience necessary to assess and modify management activities; a process that uses feedback from research, monitoring, and evaluation of management actions to support or modify objectives and strategies at all planning levels; a process in which policy decisions are implemented within a framework of scientifically driven experiments to test predictions and assumptions inherent in management plan. Analysis of results helps managers determine whether current management should continue as is or whether it should be modified to achieve desired conditions.

Administration Act—National Wildlife Refuge System Administration Act of 1966.

alternative—A reasonable way to solve an identified problem or satisfy the stated need (40 CFR 1500.2); one of several different means of accomplishing refuge purposes and goals and contributing to the Refuge System mission (Draft Service Manual 602 FW 1.5).

amphibian—A class of cold-blooded vertebrates including frogs, toads or salamanders.

animal unit month (AUM)—Measure of the quantity of livestock forage. Equivalent to the amount of forage needed to support a 1,000-pound animal (or one cow/calf pair) for 1 month.

annual—A plant that flowers and dies within 1 year of germination.

ATV—All-terrain vehicle.

AUM—*See* animal unit month.s

baseline—A set of critical observations, data, or information used for comparison or a control.

biological control—The use of organisms or viruses to control invasive plants or other pests.

biological diversity, also biodiversity—The variety of life and its processes, including the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur (Service Manual 052 FW 1.12B). The National Wildlife Refuge System's focus is on indigenous

species, biotic communities, and ecological processes.

biotic—Pertaining to life or living organisms; caused, produced by, or comprising living organisms.

canopy—A layer of foliage, generally the uppermost layer, in a vegetative stand; midlevel or understory vegetation in multilayered stands. Canopy closure (*also* canopy cover) is an estimate of the amount of overhead vegetative cover.

CCC—*See* Civilian Conservation Corps.

CCP—*See* comprehensive conservation plan.

CFR—*See* Code of Federal Regulations.

cfs—Cubic feet per second.

Civilian Conservation Corps (CCC)—Peacetime civilian “army” established by President Franklin D. Roosevelt to perform conservation activities from 1933–42. Activities included erosion control; firefighting; tree planting; habitat protection; stream improvement; and building of fire towers, roads, recreation facilities, and drainage systems.

Code of Federal Regulations (CFR)—The codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the federal government. Each volume of the CFR is updated once each calendar year.

compatibility determination—*See* compatible use.

compatible use—A wildlife-dependent recreational use or any other use of a refuge that, in the sound professional judgment of the director of the U.S. Fish and Wildlife Service, will not materially interfere with or detract from the fulfillment of the mission of the Refuge System or the purposes of the refuge (Draft Service Manual 603 FW 3.6). A compatibility determination supports the selection of compatible uses and identified stipulations or limits necessary to ensure compatibility.

comprehensive conservation plan (CCP)—A document that describes the desired future conditions of the refuge and provides long-range guidance and management direction for the refuge manager to accomplish the purposes of the refuge, contribute to the mission of the Refuge System, and to meet other relevant mandates (Draft Service Manual 602 FW 1.5).

concern—*See* issue.

cool-season grasses—Grasses that begin growth earlier in the season and often become dormant in the summer. These grasses will germinate at lower temperatures. Examples of cool-season grasses are western wheatgrass, needle and thread, and green needlegrass.

cover, also cover type, canopy cover—Present vegetation of an area.

cultural resources—The remains of sites, structures, or objects used by people in the past.

dense nesting cover (DNC)—A composition of grasses and forbs that allows for a dense stand of vegetation that protects nesting birds from the view of predators, usually consisting of one to two species of wheatgrass, alfalfa, and sweetclover.

depredation—Destruction or consumption of eggs, broods, or individual wildlife due to a predatory animal; damage inflicted on agricultural crops or ornamental plants by wildlife.

DNC—*See* dense nesting cover.

drawdown—The act of manipulating water levels in an impoundment to allow for the natural drying-out cycle of a wetland.

EA—*See* environmental assessment.

ecosystem—A dynamic and interrelating complex of plant and animal communities and their associated nonliving environment; a biological community, together with its environment, functioning as a unit. For administrative purposes, the Service has designated 53 ecosystems covering the United States and its possessions. These ecosystems generally correspond with watershed boundaries and their sizes and ecological complexity vary.

EIS—Environmental impact statement.

emergent—A plant rooted in shallow water and having most of the vegetative growth above water such as cattail and hardstem bulrush.

endangered species, federal—A plant or animal species listed under the Endangered Species Act of 1973, as amended, that is in danger of extinction throughout all or a significant portion of its range.

endangered species, state—A plant or animal species in danger of becoming extinct or extirpated in a particular state within the near future if factors contributing to its decline continue. Populations of these species are at critically low levels or their habitats have been degraded or depleted to a significant degree.

endemic species—Plants or animals that occur naturally in a certain region and whose distribution is relatively limited to a particular locality.

environmental assessment (EA)—A concise public document, prepared in compliance with the National Environmental Policy Act, that briefly discusses the purpose and need for an action and alternatives to such action, and provides sufficient evidence and analysis of impacts to determine whether to prepare an environmental impact statement or finding of no significant impact (40 CFR 1508.9).

EPA—Environmental Protection Agency.

extinction—The complete disappearance of a species from the earth; no longer existing.

extirpation—The extinction of a population; complete eradication of a species within a specified area.

fauna—All the vertebrate and invertebrate animals of an area.

federal trust resource—A trust is something managed by one entity for another who holds the ownership. The Service holds in trust many natural resources for the people of the United States of America as a result of federal acts and treaties. Examples are species listed under the Endangered Species Act, migratory birds protected by international treaties, and native plant or wildlife species found on a national wildlife refuge.

federal trust species—All species where the federal government has primary jurisdiction including federally endangered or threatened species, migratory birds, anadromous fish, and certain marine mammals.

flora—All the plant species of an area.

FMP—fire management plan.

forb—A broad-leaved, herbaceous plant; a seed-producing annual, biennial, or perennial plant that does not develop persistent woody tissue but dies down at the end of the growing season.

fragmentation—The alteration of a large block of habitat that creates isolated patches of the original habitat that are interspersed with a variety of other habitat types; the process of reducing the size and connectivity of habitat patches, making movement of individuals or genetic information between parcels difficult or impossible.

“friends” group—Any formal organization whose mission is to support the goals and purposes of its associated refuge and the National Wildlife Refuge Association overall; “friends” organizations and cooperative and interpretive associations.

FWS—*See* U.S. Fish and Wildlife Service.

geographic information system (GIS)—A computer system capable of storing and manipulating spatial data; a set of computer hardware and software

for analyzing and displaying spatially referenced features (such as points, lines and polygons) with nongeographic attributes such as species and age.

GIS—*See* geographic information system.

goal—Descriptive, open-ended, and often broad statement of desired future conditions that conveys a purpose but does not define measurable units (Draft Service Manual 620 FW 1.5).

grassland tract—A contiguous area of grassland without fragmentation.

GS—general schedule (pay rate schedule for certain federal positions).

habitat—Suite of existing environmental conditions required by an organism for survival and reproduction; the place where an organism typically lives and grows.

habitat disturbance—Significant alteration of habitat structure or composition; may be natural (for example, wildland fire) or human-caused events (for example, timber harvest and disking).

habitat type, also vegetation type, cover type—A land classification system based on the concept of distinct plant associations.

HMP—Habitat management plan.

impoundment—A body of water created by collection and confinement within a series of levees or dikes, creating separate management units although not always independent of one another.

Improvement Act—National Wildlife Refuge System Improvement Act of 1997.

indigenous—Originating or occurring naturally in a particular place.

integrated pest management (IPM)—Methods of managing undesirable species such as invasive plants; education, prevention, physical or mechanical methods of control, biological control, responsible chemical use, and cultural methods.

introduced species—A species present in an area due to intentional or unintentional escape, release, dissemination, or placement into an ecosystem as a result of human activity.

invasive plant, also noxious weed—A species that is nonnative to the ecosystem under consideration and whose introduction causes, or is likely to cause, economic or environmental harm or harm to human health.

IPM—*See* integrated pest management.

issue—Any unsettled matter that requires a management decision; for example, a Service initiative, opportunity, resource management problem, a threat to the resources of the unit, conflict in uses, public concern, or the presence of an undesirable resource condition (Draft Service Manual 602 FW 1.5).

management alternative—*See* alternative.

migration—Regular extensive, seasonal movements of birds between their breeding regions and their wintering regions; to pass usually periodically from one region or climate to another for feeding or breeding.

migratory birds—Birds which follow a seasonal movement from their breeding grounds to their wintering grounds. Waterfowl, shorebirds, raptors, and songbirds are all migratory birds.

mission—Succinct statement of purpose and/or reason for being.

mitigation—Measure designed to counteract an environmental impact or to make an impact less severe.

monitoring—The process of collecting information to track changes of selected parameters over time.

national wildlife refuge—A designated area of land, water, or an interest in land or water within the National Wildlife Refuge System, but does not include coordination areas; a complete listing of all units of the Refuge System is in the current “Annual Report of Lands Under Control of the U.S. Fish and Wildlife Service.”

National Wildlife Refuge System (Refuge System)—Various categories of areas administered by the Secretary of the Interior for the conservation of fish and wildlife including species threatened with extinction, all lands, waters, and interests therein administered by the Secretary as wildlife refuges, areas for the protection and conservation of fish and wildlife that are threatened with extinction, wildlife ranges, game ranges, wildlife management areas, and waterfowl production areas.

National Wildlife Refuge System Improvement Act of 1997 (Improvement Act)—Sets the mission and the administrative policy for all refuges in the National Wildlife Refuge System; defines a unifying mission for the Refuge System; establishes the legitimacy and appropriateness of the six priority public uses (hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation); establishes a formal process for determining appropriateness and compatibility; establish the responsibilities of the Secretary of the Interior for managing and protecting the Refuge System; requires a comprehensive conservation plan

for each refuge by the year 2012. This Act amended portions of the Refuge Recreation Act and National Wildlife Refuge System Administration Act of 1966.

native species—A species that, other than as a result of an introduction, historically occurred or currently occurs in that ecosystem.

neotropical migrant—A bird species that breeds north of the United States and Mexican border and winters primarily south of this border.

NEPA—National Environmental Policy Act.

nest success—The percentage of nests that successfully hatch one or more eggs of the total number of nests initiated in an area.

NOA—Notice of availability.

nongovernmental organization—Any group that is not composed of federal, state, tribal, county, city, town, local, or other governmental entities.

noxious weed, also invasive plant—Any living stage (including seeds and reproductive parts) of a parasitic or other plant of a kind that is of foreign origin (new to or not widely prevalent in the U.S.) and can directly or indirectly injure crops, other useful plants, livestock, poultry, other interests of agriculture, including irrigation, navigation, fish and wildlife resources, or public health. According to the Federal Noxious Weed Act (PL 93-639), a noxious weed (such as invasive plant) is one that causes disease or has adverse effects on humans or the human environment and, therefore, is detrimental to the agriculture and commerce of the U.S. and to public health.

NRCS—Natural Resources Conservation Service of the U.S. Department of Agriculture.

NWR—national wildlife refuge.

objective—An objective is a concise target statement of what will be achieved, how much will be achieved, when and where it will be achieved, and who is responsible for the work; derived from goals and provide the basis for determining management strategies. Objectives should be attainable and time-specific and should be stated quantitatively to the extent possible. If objectives cannot be stated quantitatively, they may be stated qualitatively (Draft Service Manual 602 FW 1.5).

overwater species—nesting species such as diving ducks and many colonial-nesting birds that build nests within dense stands of water-dependent plants, primarily cattail, or that build floating nests of vegetation that rest on the water.

patch—An area distinct from that around it; an area distinguished from its surroundings by environmental conditions.

perennial—Lasting or active through the year or through many years; a plant species that has a life span of more than 2 years.

plant community—An assemblage of plant species unique in its composition; occurs in particular locations under particular influences; a reflection or integration of the environmental influences on the site such as soil, temperature, elevation, solar radiation, slope, aspect, and rainfall; denotes a general kind of climax plant community, such as ponderosa pine or bunchgrass.

playa—A nearly level area at the bottom of an undrained desert basin, sometimes temporarily covered with water.

prescribed fire—The skillful application of fire to natural fuels under conditions such as weather, fuel moisture, and soil moisture that allow confinement of the fire to a predetermined area and produces the intensity of heat and rate of spread to accomplish planned benefits to one or more objectives of habitat management, wildlife management, or hazard reduction.

priority public use—One of six uses authorized by the National Wildlife Refuge System Improvement Act of 1997 to have priority if found to be compatible with a refuge's purposes. This includes hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation.

proposed action—The alternative proposed to best achieve the purpose, vision, and goals of a refuge (contributes to the Refuge System mission, addresses the significant issues, and is consistent with principles of sound fish and wildlife management).

public—Individuals, organizations, and groups; officials of federal, state, and local government agencies; Indian tribes; and foreign nations. It may include anyone outside the core planning team. It includes those who may or may not have indicated an interest in Service issues and those who do or do not realize that Service decisions may affect them.

public involvement—A process that offers affected and interested individuals and organizations an opportunity to become informed about, and to express their opinions on, Service actions and policies. In the process, these views are studied thoroughly and thoughtful consideration of public views is given in shaping decisions for refuge management.

purpose of the refuge—The purpose of a refuge is specified in or derived from the law, proclamation, executive order, agreement, public land order, donation document, or administrative memorandum establishing authorization or expanding a refuge, refuge unit, or refuge subunit (Draft Service Manual 602 FW 1.5).

raptor—A carnivorous bird such as a hawk, a falcon, or a vulture that feeds wholly or chiefly on meat taken by hunting or on carrion (dead carcasses).

Reclamation—Bureau of Reclamation of the U.S. Department of the Interior.

refuge operations needs system (RONS)—A national database that contains the unfunded operational needs of each refuge. Projects included are those required to implement approved plans and meet goals, objectives, and legal mandates.

refuge purpose—*See* purpose of the refuge.

Refuge System—*See* National Wildlife Refuge System.

refuge use—Any activity on a refuge, except administrative or law enforcement activity, carried out by or under the direction of an authorized Service employee.

resident species—A species inhabiting a given locality throughout the year; nonmigratory species.

rest—Free from biological, mechanical, or chemical manipulation, in reference to refuge lands.

restoration—Management emphasis designed to move ecosystems to desired conditions and processes, such as healthy upland habitats and aquatic systems.

riparian area *or* **riparian zone**—An area or habitat that is transitional from terrestrial to aquatic ecosystems including streams, lakes, wet areas, and adjacent plant communities and their associated soils that have free water at or near the surface; an area whose components are directly or indirectly attributed to the influence of water; of or relating to a river; specifically applied to ecology, “riparian” describes the land immediately adjoining and directly influenced by streams. For example, riparian vegetation includes all plant life growing on the land adjoining a stream and directly influenced by the stream.

RONS—*See* refuge operations needs system.

SAMMS—*See* Service Asset Maintenance Management System.

scoping—The process of obtaining information from the public for input into the planning process.

seasonally flooded—Surface water is present for extended periods in the growing season, but is absent by the end of the season in most years.

sediment—Material deposited by water, wind, and glaciers.

Service—*See* U.S. Fish and Wildlife Service.

Service Asset Maintenance Management System

(SAMMS)—A national database which contains the unfunded maintenance needs of each refuge; projects include those required to maintain existing equipment and buildings, correct safety deficiencies for the implementation of approved plans, and meet goals, objectives, and legal mandates.

shelterbelt—Single to multiple rows of trees and shrubs planted around cropland or buildings to block or slow down the wind.

shorebird—Any of a suborder (*Charadrii*) of birds such as a plover or a snipe that frequent the seashore or mud flat areas.

spatial—Relating to, occupying, or having the character of space.

special status species—Plants or animals that have been identified through federal law, state law, or agency policy as requiring special protection of monitoring. Examples include federally listed endangered, threatened, proposed, or candidate species; state-listed endangered, threatened, candidate, or monitor species; Service’s species of management concern; species identified by the Partners in Flight program as being of extreme or moderately high conservation concern.

special use permit—A permit for special authorization from the refuge manager required for any refuge service, facility, privilege, or product of the soil provided at refuge expense and not usually available to the general public through authorizations in Title 50 CFR or other public regulations (“Refuge Manual” 5 RM 17.6).

species of concern—Those plant and animal species, while not falling under the definition of special status species, that are of management interest by virtue of being federal trust species such as migratory birds, important game species, or significant keystone species; species that have documented or apparent populations declines, small or restricted populations, or dependence on restricted or vulnerable habitats.

spoil piles—Spoil piles (also known as stock piles or storage piles) are excavated materials consisting of topsoil or subsoils that have been removed and temporarily stored during construction activity. Proper placement and stabilization of spoil piles helps reduce soil erosion.

step-down management plan—A plan that provides the details necessary to implement management strategies identified in the comprehensive conservation plan (“Draft Service Manual” 602 FW 1.5).

strategy—A specific action, tool, or technique or combination of actions, tools, and techniques used to meet unit objectives (“Draft Service Manual” 602 FW 1.5).

submergent—A vascular or nonvascular hydrophyte, either rooted or nonrooted, that lies entirely beneath the water surface, except for flowering parts in some species.

threatened species, federal—Species listed under the Endangered Species Act of 1973, as amended, that are likely to become endangered within the foreseeable future throughout all or a significant portion of their range.

threatened species, state—A plant or animal species likely to become endangered in a particular state within the near future if factors contributing to population decline or habitat degradation or loss continue.

travel corridor—A landscape feature that facilitates the biologically effective transport of animals between larger patches of habitat dedicated to conservation functions. Such corridors may facilitate several kinds of traffic including frequent foraging movement, seasonal migration, or the once in a lifetime dispersal of juvenile animals. These are transition habitats and need not contain all the habitat elements required for long-term survival or reproduction of its migrants.

trust resource—*See* federal trust resource.

trust species—*See* federal trust species.

U.S. Fish and Wildlife Service (Service, USFWS, FWS)—The principal federal agency responsible for conserving, protecting, and enhancing fish and wildlife and their habitats for the continuing benefit of the American people. The Service manages the 93-million-acre National Wildlife Refuge System comprised of more than 530 national wildlife refuges and thousands of waterfowl production areas. It also operates 65 national fish hatcheries and 78 ecological service field stations, the agency enforces federal wildlife laws, manages migratory bird populations, restores national significant fisheries, conserves and restores wildlife habitat such as wetlands, administers the Endangered Species Act, and helps foreign governments with their conservation efforts. It also oversees the federal aid program that distributes millions of dollars in excise taxes on fishing and hunting equipment to state wildlife agencies.

USFWS—*See* U.S. Fish and Wildlife Service.

U.S. Geological Survey (USGS)—A federal agency whose mission is to provide reliable scientific information to describe and understand the earth; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life.

USGS—*See* U.S. Geological Survey.

vision statement—A concise statement of the desired future condition of the planning unit, based primarily on the Refuge System mission, specific refuge purposes, and other relevant mandates (“Draft Service Manual” 602 FW 1.5).

visual obstruction—Pertaining to the density of a plant community; the height of vegetation that blocks the view of predators and conspecifics to a nest.

visual obstruction reading (VOR)—A method of visually quantifying vegetative structure and composition.

VOR—*See* visual obstruction reading.

wading birds—Birds having long legs that enable them to wade in shallow water including egrets, great blue herons, black-crowned night-herons, and bitterns.

waterfowl—A category of birds that includes ducks, geese, and swans.

watershed—The region draining into a river, a river system, or a body of water.

wetland management district (WMD)—Land that the Refuge System acquires with Federal Duck Stamp funds for restoration and management primarily as prairie wetland habitat critical to waterfowl and other wetland birds.

WG—wage grade schedule (pay rate schedule for certain federal positions).

wildland fire—A free-burning fire requiring a suppression response; all fire other than prescribed fire that occurs on wildlands (“Service Manual” 621 FW 1.7).

wildlife-dependent recreational use—Use of a refuge involving hunting, fishing, wildlife observation, wildlife photography, environmental education, or interpretation. The National Wildlife Refuge System Improvement Act of 1997 specifies that these are the six priority general public uses of the Refuge System.

WMD—*See* wetland management district.

woodland—Open stands of trees with crowns not usually touching, generally forming 25–60 percent cover.

WUI—wildland–urban interface.

Appendix A

Key Legislation and Policies

This appendix briefly describes the guidance for the National Wildlife Refuge System and other policies and key legislation that guide the management of the Laramie Plains National Wildlife Refuges.

NATIONAL WILDLIFE REFUGE SYSTEM

The mission of the Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

National Wildlife Refuge System Improvement Act of 1997.

Goals

- Fulfill our statutory duty to achieve refuge purpose(s) and further the System mission.
- Conserve, restore where appropriate, and enhance all species of fish, wildlife, and plants that are endangered or threatened with becoming endangered.
- Perpetuate migratory bird, interjurisdictional fish, and marine mammal populations.
- Conserve a diversity of fish, wildlife, and plants.
- Conserve and restore, where appropriate, representative ecosystems of the United States, including the ecological processes characteristic of those ecosystems.
- Foster understanding and instill appreciation of fish, wildlife, and plants, and their conservation, by providing the public with safe, high-quality, and compatible wildlife-dependent public use. Such use includes hunting, fishing, wildlife observation and photography, and environmental education and interpretation.

Guiding Principles

There are four guiding principles for management and general public use of the Refuge System established by Executive Order 12996 (1996):

- **Public Use**—The Refuge System provides important opportunities for compatible wildlife-dependent recreational activities involving hunting, fishing, wildlife observation and photography, and environmental education and interpretation.
- **Habitat**—Fish and wildlife will not prosper without high-quality habitat, and without fish and wildlife, traditional uses of refuges cannot be sustained. The Refuge System will continue to conserve and enhance the quality and diversity of fish and wildlife habitat within refuges.
- **Partnerships**—America’s sportsmen and women were the first partners who insisted on protecting valuable wildlife habitat within wildlife refuges. Conservation partnerships with other federal agencies, state agencies, tribes, organizations, industry, and the general public can make significant contributions to the growth and management of the Refuge System.
- **Public Involvement**—The public should be given a full and open opportunity to participate in decisions regarding acquisition and management of our national wildlife refuges.

LEGAL AND POLICY GUIDANCE

Management actions on national wildlife refuges are circumscribed by many mandates including laws and executive orders, the latest of which is the Volunteer and Community Partnership Enhancement Act of 1998. Regulations that affect refuge management the most are listed below.

American Indian Religious Freedom Act (1978)—Directs agencies to consult with native traditional religious leaders to determine appropriate policy changes necessary to protect and preserve Native American religious cultural rights and practices.

Americans with Disabilities Act (1992)—

Prohibits discrimination in public accommodations and services.

Antiquities Act (1906)—Authorizes the scientific investigation of antiquities on federal land and provides penalties for unauthorized removal of objects taken or collected without a permit.

Archaeological and Historic Preservation Act (1974)—Directs the preservation of historic and archaeological data in federal construction projects.

Archaeological Resources Protection Act (1979), as amended—Protects materials of archaeological interest from unauthorized removal or destruction and requires federal managers to develop plans and schedules to locate archaeological resources.

Architectural Barriers Act (1968)—Requires federally owned, leased, or funded buildings and facilities to be accessible to persons with disabilities.

Clean Water Act (1977)—Requires consultation with the U.S. Army Corps of Engineers (40 permits) for major wetland modifications.

Endangered Species Act (1973)—Requires all federal agencies to carry out programs for the conservation of endangered and threatened species.

Executive Order No. 7168 (1935)—Establishes Arrowwood Migratory Waterfowl Refuge “as a refuge and breeding ground for migratory birds and other wild life... to effectuate further the purposes of the Migratory Bird Conservation Act....”

Executive Order 11988 (1977)—Requires federal agencies to provide leadership and take action to reduce the risk of flood loss, minimize the impact of floods on human safety, and preserve the natural and beneficial values served by the floodplains.

Executive Order 12996, Management and General Public Use of the National Wildlife Refuge System (1996)—Defines the mission, purpose, and priority public uses of the National Wildlife Refuge System. It also presents four principles to guide management of the Refuge System.

Executive Order 13007, Indian Sacred Sites (1996)—Directs federal land management agencies to accommodate access to and ceremonial uses of Indian sacred sites by Indian religious practitioners, avoid adversely affecting the physical integrity of such sacred sites, and where appropriate, maintain the confidentiality of sacred sites.

Federal Noxious Weed Act (1990)—Requires the use of integrated management systems to control or contain undesirable plant species and an interdisciplinary approach with the cooperation of other federal and state agencies.

Federal Records Act (1950)—Requires the preservation of evidence of the government’s organization, functions, policies, decisions, operations, and activities, as well as basic historical and other information.

Fish and Wildlife Coordination Act (1958)—Allows the U.S. Fish and Wildlife Service to enter into agreements with private landowners for wildlife management purposes.

Migratory Bird Conservation Act (1929)—Establishes procedures for acquisition by purchase, rental, or gifts of areas approved by the Migratory Bird Conservation Commission.

Migratory Bird Hunting and Conservation Stamp Act (1934)—Authorizes the opening of part of a refuge to waterfowl hunting.

Migratory Bird Treaty Act (1918)—Designates the protection of migratory birds as a federal responsibility; and enables the setting of seasons and other regulations, including the closing of areas, federal or nonfederal, to the hunting of migratory birds.

National Environmental Policy Act (1969)—Requires all agencies, including the Service, to examine the environmental impacts of their actions, incorporate environmental information, and use public participation in the planning and implementation of all actions. Federal agencies must integrate this Act with other planning requirements, and prepare appropriate documents to facilitate better environmental decision making. [From the “Code of Federal Regulations” (CFR), 40 CFR 1500]

National Historic Preservation Act (1966), as amended—Establishes as policy that the federal government is to provide leadership in the preservation of the Nation’s prehistoric and historical resources.

National Wildlife Refuge System Administration Act (1966)—Defines the National Wildlife Refuge System and authorizes the Secretary of the Interior to permit any use of a refuge, provided such use is compatible with the major purposes for which the refuge was established.

National Wildlife Refuge System Improvement Act of 1997—Sets the mission and administrative policy for all refuges in the National Wildlife Refuge System; mandates comprehensive conservation planning for all units of the Refuge System.

Native American Graves Protection and Repatriation Act (1990)—Requires federal agencies and museums to inventory, determine ownership of, and repatriate cultural items under their control or possession.

Refuge Recreation Act (1962)—Allows the use of refuges for recreation when such uses are compatible with the refuge’s primary purposes and when sufficient funds are available to manage the uses.

Rehabilitation Act (1973)—Requires programmatic accessibility in addition to physical accessibility for all facilities and programs funded by the federal government to ensure that any person can participate in any program.

Rivers and Harbors Act (1899)—Section 10 of this Act requires the authorization of U.S. Army Corps of Engineers prior to any work in, on, over, or under navigable waters of the United States.

Volunteer and Community Partnership Enhancement Act (1998)—Encourages the use of volunteers to assist in the management of refuges within the Refuge System; facilitates partnerships between the Refuge System and nonfederal entities to promote public awareness of the resources of the Refuge System and public participation in the conservation of the resources; and encourages donations and other contributions.

Appendix B

List of Preparers, Consultation, and Coordination

This document is the result of the extensive, collaborative, and enthusiastic efforts by the seven members of the Laramie Plains refuges planning team below. Many others contributed insight and support.

Planning Team

<i>Team Member</i>	<i>Position</i>	<i>Work Unit</i>
Andrea Cerovski	Wildlife biologist	Wyoming Game and Fish Department; Lander, WY
Mark Ely	Geographic information system (GIS) specialist	USFWS, Region 6; Lakewood, CO
Toni Griffin	Planning team leader	USFWS, Region 6; Lakewood, CO
Pam Johnson	Wildlife biologist	Arapaho NWR; Walden, CO
Mark Lanier	<i>Former</i> assistant refuge manager	Arapaho NWR; Walden, CO
Larry Roberts	Wildlife biologist	Wyoming Game and Fish Department; Casper, WY
Ann Timberman	Project leader	Arapaho NWR; Walden, CO

Contributors

The Service would like to acknowledge the efforts of the following individuals and organizations toward the completion of this draft CCP and EA. The diversity, talents, and knowledge they contributed dramatically improved the vision and completeness of this document.

<i>Name</i>	<i>Position</i>	<i>Work Unit</i>
BBC Research & Consulting	Socioeconomic impact studies	Contractor
Rick Coleman	Assistant regional director, refuge system	USFWS
Megan Estep	Chief hydrologist	USFWS
Sheri Fetherman	Chief, division of education and visitor services	USFWS
Wayne King	Biologist, refuge system	USFWS
Deb Parker	Writer-editor	USFWS
Dean Rundle	Refuge supervisor	USFWS
Richard Schroeder	Wildlife biologist	USGS

Shapins Associates	Writer-editor; layout	Contractor
Michael Spratt	Chief, division of refuge planning	USFWS
Richard Sterry	Regional fire planner	USFWS
Meg VanNess	Regional archaeologist	USFWS
Dave Wiseman	Refuge supervisor, <i>retired</i>	USFWS
Wyoming Toad Recovery Team	Wyoming toad recovery	USFWS

Appendix C

Public Involvement

Public scoping was initiated for the Laramie Plains refuges in a notice of intent (NOI) dated June 16, 2006. The NOI announced intent to prepare a comprehensive conservation plan and environmental assessment for the refuges and to obtain suggestions and information on the scope of issues to be considered in the planning process.

A public meeting was held in Laramie, Wyoming, on May 25, 2006. Approximately 31 people attended the meeting. Numerous written comments were received during the open comment period. Comments received identified biological, social, and economic concerns regarding refuge management. The mailing list for the CCP and EA follows.

Federal Officials

U.S. Representative Barbara Cubin, Washington DC

Rep. Cubin's Area Director, Cheyenne, WY

U.S. Senator Craig Thomas, Washington DC

Sen. Thomas's Area Director, Casper, WY

U.S. Senator Michael Enzi, Washington DC

Sen. Enzi's Area Director, Cheyenne, WY

Federal Agencies

Bureau of Land Management; Cheyenne, WY; Rawlins, WY

National Park Service, Omaha, NE

USFWS, Ecological Services, Cheyenne, WY

USFWS, National Wildlife Refuge System; Albuquerque, NM; Anchorage, AK; Arlington, VA; Atlanta, GA; Fort Snelling, MN; Hadley, MA; Portland, OR; Rawlins, WY; Sacramento, CA; Shepherdstown, WV; Washington DC

USGS-Fort Collins Science Center, Ft. Collins, CO

Tribal Officials

Arapaho Business Committee, Fort Washakie, Wyoming

Crow Tribal Council, Crow Agency, Montana

Northern Cheyenne Tribal Council, Lame Deer, Montana

Oglala Sioux Tribal Council, Pine Ridge, South Dakota

Shoshone Business Council, Fort Washakie, Wyoming

State Officials

Governor Dave Freudenthal, Cheyenne, WY

Representative Kermit Brown, Laramie, WY

Representative Kurt S. Bucholz, Saratoga, WY

Representative Jim Slater, Laramie, WY

Representative Jane Warren, Laramie, WY

Representative Kevin White, Laramie, WY

Senator Mike Massie, Laramie, WY

Senator Phil Nicholas, Laramie, WY

State Agencies

Wyoming Department of Agriculture, Cheyenne, WY

Wyoming Game and Fish Department; Casper, WY; Lander, WY; Laramie, WY

Wyoming Game Fish Commission, Cheyenne, WY

Wyoming Office of State Lands and Investments, Cheyenne, WY

Wyoming State Historic Preservation Office, Cheyenne, WY

Local Government

Albany County Commissioners, Laramie, WY

Laramie Rivers Conservation District, Safe Harbor Liaison, Laramie, WY

Mayor, Laramie, WY

Organizations

American Bird Conservancy, Plains, VA

American Rivers, Washington DC

Audubon Wyoming, Casper, WY; Laramie, WY; Tie Siding, WY

Biodiversity Conservation Alliance, Laramie, WY
Defenders of Wildlife, Washington DC
Ducks Unlimited, Memphis, TN
Izaak Walton League, Gaithersburg, MD
League of Women Voters of Wyoming, Laramie, WY
Murie Audubon Society, Casper, WY
National Audubon Society; Washington DC; New York, NY
National Trappers Association, New Martinsville, WV
National Wildlife Federation, Reston, VA
National Wildlife Refuge Association, Washington DC
Sierra Club; San Francisco, CA; Sheridan, WY
The Nature Conservancy, Boulder, CO
The U.S. Humane Society, Washington, DC
The Wilderness Society, Washington DC
Union Pacific Railroad, Omaha, NE
Wildlife Management Institute; Fort Collins, CO; Corvallis, OR; Washington DC
Wyoming Natural diversity Database, Laramie, WY
Wyoming Outdoor Council, Logan, UT

Universities, Colleges, and Schools

University of Wyoming, Real Estate Operations, Laramie, WY
University of Wyoming, School of Environment and Natural Resources, Laramie, WY

Media

Casper Star Tribune, Casper, WY
Daily Boomerang, Laramie, WY
KCGY, Laramie, WY
KIMX, Laramie, WY
KISS, Casper, WY
KKTY, Douglas, WY
Rawlins Daily Times, Rawlins, WY
Wyoming Public Radio, Laramie, WY

Individuals

71 individuals

Appendix D

Divestiture Analysis

Introduction

During the Comprehensive Conservation Plan (CCP) process, Bamforth National Wildlife Refuge was identified as a candidate for divestiture from the National Wildlife Refuge System (Refuge System). The refuge was analyzed by the planning team to determine whether or not it warranted status as a national wildlife refuge.

The divestiture model represents a set of criteria for measuring the value of a refuge. Designed as a preplanning tool, the model allows planners and refuge managers to determine whether or not a refuge or easement refuge should be considered for divestiture. If the model indicates that a refuge should be considered for divestiture, the process and consequences of divestiture will be studied further during the CCP process.

In the case of Bamforth NWR, the planning team did not have enough knowledge of the refuge resources to answer the model questions with a high degree of confidence. Following the analysis, the planning team decided to retain Bamforth NWR in the Refuge System due to the lack of knowledge and understanding of the refuge's resources and the role the refuge serves in supporting the mission of the Refuge System.

The Divestiture Model

Region 6's divestiture model was developed during a two-day workshop held December 14–15, 2004, at the regional office in Denver, Colorado. The purpose of the workshop was to develop a standard policy in region 6 for identifying which refuges to consider for divestiture. The model consists of a set of nine questions that must be addressed when considering a refuge for divestiture.

Since its development, the model has been used to evaluate a number of refuges for divestiture consideration with analysis resulting in the recommendation of some refuges for divestiture and others to be retained in the Refuge System.

Divestiture Model Applied to Bamforth NWR

1. Does the refuge achieve one or more of the Refuge System goals?

Yes, but none clearly so.

To fulfill our statutory duty to achieve refuge purpose(s) and further the System Mission: Refuge is a breeding ground for birds, but not necessarily due to refuge management, since none has occurred, or is it any better than /different from surrounding lands.

Conserve, restore where appropriate, and enhance all species of fish, wildlife, and plants that are endangered or threatened with becoming endangered: *A memo dated March 31, 2005, shows the potential threatened and endangered species for Bamforth NWR as bald eagle, black-footed ferret, and Ute ladies'-tresses. Records indicate that no surveys have been conducted for these species on the refuge. Prairie dog numbers are not known, but the paved state highway running through the refuge and I-80 immediately south would seem to preclude the area as a likely ferret recovery area. Alkaline soils of the refuge would likely preclude Ute ladies'-tresses from use of the refuge.*

Perpetuate migratory bird, interjurisdictional fish, and marine mammal populations: *In good water years, some colonial nesting bird use.*

Conserve a diversity of fish, wildlife, and plants: *Management options are limited in trying to increase existing diversity. Unknown what diversity is there currently due to lack of knowledge of existing refuge resources.*

Conserve and restore as appropriate representative ecosystems of the United States, including the ecological processes characteristic of those ecosystems: *No. Too small an area to affect ecological processes characteristics.*

To foster understanding and instill appreciation of native fish, wildlife, and plants, and their conservation, by providing the public with safe, high-quality, and compatible wildlife-dependent public use. Such use includes hunting, fishing, wildlife observation and photography, and environmental education and interpretation: *Refuge is currently closed to all public use.*

2. Does the refuge meet its purpose (fulfilling the refuge's intent and statutory purpose)?

Yes.

3. Does the refuge provide substantial support for migratory bird species, provide important sheltering, feeding, and breeding habitat for threatened and endangered species, or support species identified in authorizing legislation?

No, but more research is needed. Early 1990s annual narrative discusses 200 white pelicans produced. The importance of Bamforth NWR to area pelican nesting should be known to answer this question with a degree of confidence.

4. Does the refuge have biological integrity; if not, is it feasible to restore the biological integrity of the converted or degraded habitat?

Unknown. The refuge is located in a basin in a low-precipitation zone, with poor soils and low vegetative potential. Most vegetation on the refuge is native, but it is unknown whether the area has been farmed or degraded by other management actions (development of irrigation ditches, water control structures, overgrazing, and so forth).

5. Does the refuge contribute to landscape conservation, provide a stepping stone for migratory birds, or serve a unique habitat patch important to the conservation of a trust species?

The refuge may serve as a stepping stone for migratory birds as there are several lakes and mud flats in the Laramie Plains refuges, but specific migratory bird use is unknown at this time due to lack of information. Refuge habitat types are

plentiful in the region and similar to adjacent lands; the refuge does not serve as a unique habitat patch important to the conservation of a trust species.

6. Is there such significant community interest support for the refuge that divestiture would result in unacceptable long-term public relations?

No.

7. Do we have or can we acquire the jurisdiction to meet the refuge purpose, NWRS mission and goals, and prevent incompatible uses?

Yes. Refuge lands are owned in fee title by the Service.

8. Can someone else achieve most or all of the purposes of the refuge without the Service having to incur costs?

Unknown.

9. Cost/liability

Costs are limited to staff time and fuel for 1–4 trips to the refuge annually. No known liability issues exist.

Appendix E

Fire Management Program

The Service has management and administrative responsibility, including fire management, for the Laramie Plains refuges, which covers approximately 4,860 acres in south-central Wyoming.

THE ROLE OF FIRE

In ecosystems of the Great Plains, vegetation has evolved under periodic disturbance and defoliation from grazing, fire, drought, and floods. This periodic disturbance is what kept the ecosystem diverse and healthy while maintaining significant biodiversity for thousands of years.

Historically, natural fire and Native American ignitions have played an important disturbance role in many ecosystems by removing fuel accumulations, decreasing the impacts of insects and diseases, stimulating regeneration, cycling nutrients, and providing a diversity of habitats for plants and wildlife.

When fire and/or grazing are excluded from prairie landscapes, fuel loadings increase due to a build-up of thatch and invasion of woody vegetation. This increase in fuel loadings leads to an increase in a fire's resistance to control which threatens firefighter and public safety as well as federal and private facilities.

However, fire when properly utilized, can:

- reduce hazardous fuels build-up in both wildland-urban interface (WUI) and non-WUI areas;
- improve wildlife habitats by reducing density of vegetation and/or changing plant species composition;
- sustain and/or increase biological diversity;
- improve woodlands and shrublands by reducing plant density;
- reduce susceptibility of plants to insect and disease outbreaks;
- improve quality and quantity of livestock forage;
- improve the quantity of water available for municipalities and activities dependent on wildlands for their water supply.

WILDLAND FIRE MANAGEMENT POLICY AND GUIDANCE

In 2001, an update of the 1995 "Federal Fire Policy" was completed and approved by the Secretaries of Interior and Agriculture. The 2001 "Federal Wildland Fire Management Policy" directs federal agencies to achieve a balance between fire suppression to protect life, property, and resources and fire use to regulate fuels and maintain healthy ecosystems. In addition, it directs agencies to use the appropriate management response for all wildland fire regardless of the ignition source. This policy provides eight guiding principles that are fundamental to the success of the fire management program:

- Firefighter and public safety is the first priority in every fire management activity.
- The role of wildland fires as an ecological process and natural change agent will be incorporated into the planning process.
- Fire management plans (FMPs), programs, and activities support land and resource management plans and their implementation.
- Sound risk management is a foundation for all fire management activities.
- Fire management programs and activities are economically viable, based on values to be protected, costs, and land and resource management objectives.
- FMPs and activities are based on the best available science.
- FMPs and activities incorporate public health and environmental quality consideration.
- Federal, state, tribal, local, interagency, and international coordination and cooperation are essential.
- Standardization of policies and procedures among federal agencies is an ongoing objective.

The fire management considerations, guidance, and direction should be addressed in the land use resource plans (for example, the CCP). FMPs are step-down processes from the land use plans and

habitat plans, with more detail on fire suppression, fire use, and fire management activities.

MANAGEMENT DIRECTION

The Laramie Plains refuges will protect life, property, and other resources from wildland fire by safely suppressing all wildfires. Prescribed fire as well as manual and mechanical fuel treatments will be used in an ecosystem context to protect both federal and private property and for habitat management purposes. Fuel reduction activities will be applied in collaboration with federal, state, private and NGO partners. In addition, fuel treatments will be prioritized based on the guidance for prioritization established in the goals and strategies outlined in the U.S. Fish and Wildlife Service's National Wildlife Refuge System Wildland Fire Management Program Strategic Plan 2003–2010 and the R6 Refuges Regional Priorities FY07–11. For WUI treatments, areas with community wildfire protection plans (CWPPs) and communities at risk (CARs) will be the primary focus.

All aspects of the fire management program will be conducted in a manner consistent with applicable laws, policies, and regulations. The Laramie Plains refuge stations will maintain an FMP to accomplish the fire management goals described below. Prescribed fire, manual, and mechanical fuel treatments will be applied in a scientific way under selected weather and environmental conditions.

Fire Management Goals

The goals and strategies of the U.S. Fish and Wildlife Service's National Wildlife Refuge System Wildland Fire Management Program Strategic Plan are consistent with Department and Service policies, National Fire Plan direction, President Bush's Healthy Forest Initiative, the 10-Year Comprehensive Strategy and Implementation Plan, National Wildfire Coordinating Group (NWCG) Guidelines, initiatives of the Wildland Fire Leadership Council, and Interagency Standards for Fire and Aviation Operations.

The R6 Refuges Regional Priorities FY07–11 are consistent with the refuges' vision statement for region 6: "to maintain and improve the biological integrity of the region, ensure the ecological condition of the region's public and private lands are better understood, and endorse sustainable use of habitats that support native wildlife and people's livelihoods." The fire management goals for the Laramie Plains refuges are to use prescribed fire, manual, and mechanical treatments to: (1) reduce the threat to life and property through hazardous fuels reduction treatments, (2) meet the habitat goals and objectives identified in this CCP, and (3)

reintroduce fire to ecosystems that evolved with fire as a disturbance factor.

Fire Management Objective

The objective of the fire management program is to utilize prescribed fire, manual, and mechanical treatment methods to treat between 10 and 500 acres over the life of the plan.

Strategies

Strategies and tactics that consider public and firefighter safety as well as resource values at risk will be used. Wildland fire suppression, prescribed fire methods, manual and mechanical means, timing, and monitoring are described in more detail within the step-down FMP(s).

All management actions would use prescribed fire, manual and/or mechanical means to reduce hazardous fuels, restore and maintain desired habitat conditions, control non-native vegetation, and control the spread of woody vegetation within the diverse ecosystem habitats. The fuels treatment program will be outlined in the FMP for the refuges. Prescribed fire burn plans will be developed site specific following the Interagency Prescribed Fire Planning and Implementation Procedures Reference Guide (2006) template.

Prescribed fire temporarily reduces air quality by reducing visibility and releasing components through combustion. The refuges will meet the Clean Air Act emission standards by adhering to the "Wyoming State Implementation Plan" requirements during all prescribed fire activities.

FIRE MANAGEMENT ORGANIZATION, CONTACTS, AND COOPERATION

Qualified fire management technical oversight for the refuges will be established by region 6 of the Service, using the fire management district approach. Under this approach, fire management staff will be determined by established modeling systems based on the fire management workload of a group of refuges, and possibly that of interagency partners. The fire management workload consists of historical wildland fire suppression activities as well as historical and planned fuels treatments.

Depending on budgets, fire management staffing and support equipment may be located at the administrative station or at other refuges within the district and shared between all units. Fire management activities will be conducted in a coordinated and collaborative manner with federal and nonfederal partners.

On approval of this CCP, new FMP(s) will be developed for the Laramie Plains refuges. The FMP(s) may be done as: (1) an FMP that covers each individual refuge, (2) an FMP that covers the refuges within this CCP, (3) an FMP that covers the administrative district, or (4) an interagency FMP.

Appendix F

List of Plant Species

The following plant species that occur at the Laramie Plains refuges are listed in alphabetic order of their scientific names. Species may be found on one or more of the three refuges.

Scientific Name	Common Name
<i>Achillea millefolium</i>	Common yarrow
<i>Achnatherum hymenoides</i>	Indian ricegrass
<i>Agoseris glauca</i>	Mountain dandelion
<i>Agropyron cristatum</i>	Crested wheatgrass
<i>Agrostis stolonifera</i>	Creeping bentgrass
<i>Alopecurus arundinaceus</i>	Creeping meadow foxtail
<i>Antennaria microphylla</i>	Littleleaf pussytoes
<i>Argentina anserina</i>	Silverweed cinquefoil
<i>Artemisia frigida</i>	Fringed sage
<i>Artemisia tridentata wyomingensis</i>	Wyoming big sagebrush
<i>Artemisia tridentata vaseyana</i>	Mountain big sagebrush
<i>Aster ascendens</i>	Western aster
<i>Aster falcatum</i>	White prairie aster
<i>Astragalus agrestis</i>	Field milkvetch
<i>Astragalus bodinii</i>	Bodin's milkvetch
<i>Astragalus</i> spp.	Milkvetch
<i>Atriplex gardneri</i>	Gardner's saltbush
<i>Bouteloua gracilis</i>	Blue grama
<i>Brassicaceae</i> spp.	Mustard
<i>Bromus tectorum</i>	Cheatgrass
<i>Calamagrostis stricta</i>	Reedgrass
<i>Camelina microcarpa</i>	Littlepod false flax
<i>Carex nebrascensis</i>	Nebraska sedge
<i>Carex praegracilis</i>	Clustered field sedge
<i>Chenopodium rubrum</i>	Red goosefoot
<i>Chrysothamnus</i> spp.	Rabbitbrush
<i>Cirsium arvense</i>	Canada thistle
<i>Cirsium canescens</i>	Prairie thistle
<i>Cleome serrulata</i>	Rocky mountain bee plant
<i>Conyza canadensis</i>	Canadian horseweed
<i>Crepis runcinata</i>	Hawk's beard
<i>Cryptantha</i> spp.	Cryptantha
<i>Cryptantha thyrsoiflora</i>	Calcareous cryptantha
<i>Delphinium geyeri</i>	Geyer's larkspur
<i>Deschampsia caespitosa</i>	Tufted hairgrass
<i>Descurainia sophia</i>	Flixweed

Scientific Name	Common Name
<i>Distichlis spicata</i>	Saltgrass
<i>Elymus triticoides</i>	Alkali wildrye
<i>Eleocharis fallax</i>	Creeping spikerush
<i>Eleocharis</i> spp.	Spikerush
<i>Elymus lanceolatus</i>	Thickspike wheatgrass
<i>Elymus</i> spp.	Wheatgrass
<i>Elymus trachycaulus</i>	Slender wheatgrass
<i>Epilobium ciliatum</i>	Fringed willowherb
<i>Equisetum laevigatum</i>	Smooth horsetail
<i>Erigeron</i> spp.	Fleabane
<i>Eriogonum brevicaulis</i>	Shortstem buckwheat
<i>Eriogonum flavum</i>	Alpine golden buckwheat
<i>Eriogonum ovalifolium</i>	Cushion buckwheat
<i>Eriogonum</i> spp.	Buckwheat
<i>Erysimum capitatum</i>	Sanddune wallflower
<i>Erysimum</i> spp.	Wallflower
<i>Festuca</i> spp.	Fescue
<i>Gentianella amarella</i>	Autumn dwarf gentian
<i>Glaux maritima</i>	Sea milkwort
<i>Grindelia squarrosa</i>	Curlycup gumweed
<i>Gutierrezia sarothrae</i>	Broom snakeweed
<i>Hesperostipa comata</i>	Needleandthread
<i>Heterotheca subaxillaris</i>	Camphorweed
<i>Hippuris vulgaris</i>	Common mare's-tail
<i>Hordeum jubatum</i>	Foxtail barley
<i>Iris missouriensis</i>	Rocky Mountain iris
<i>Juncus balticus</i>	Baltic rush
<i>Juncus bufonius</i>	Toad rush
<i>Juncus compressus</i>	Roundfruit rush
<i>Juncus longistylis</i>	Longstyle rush
<i>Juncus nevadensis</i>	Sierra rush
<i>Juncus torreyi</i>	Torrey's rush
<i>Koeleria macrantha</i>	Prairie Junegrass
<i>Krascheninnikovia lanata</i>	Winterfat
<i>Lappula</i> spp.	Stickseed
<i>Lepidium densiflorum</i>	Common pepperweed
<i>Lepidium perfoliatum</i>	Clasping pepperweed
<i>Lepidium</i> spp.	Pepperweed
<i>Linanthus pungens</i>	Granite prickly phlox
<i>Lesquerella ludoviciana</i>	Foothill bladderpod

Scientific Name	Common Name
<i>Lesquerella</i> spp.	Bladderpod
<i>Lygodesmia juncea</i>	Rush skeletonplant
<i>Melilotus officinalis</i>	Yellow sweetclover
<i>Melilotus</i> spp.	Sweetclover
<i>Mentha arvensis</i>	Wild mint
<i>Mertensia</i> spp.	Bluebells
<i>Mimulus glabratus</i>	Roundleaf monkeyflower
<i>Mirabilis linearis</i>	Narrowleaf four o'clock
<i>Muhlenbergia filiformis</i>	Pullup muhly
<i>Oenothera coronopifolia</i>	Crownleaf evening-primrose
<i>Opuntia</i> spp.	Pricklypear
<i>Orobanche fasciculata</i>	Clustered broomrape
<i>Orobanche ludoviciana</i>	Louisiana broomrape
<i>Oxytropis deflexa</i>	Nodding locoweed
<i>Oxytropis</i> spp.	Locoweed
<i>Parnassia palustris</i>	Marsh grass of Parnassus
<i>Paronychia sessiliflora</i>	Creeping nailwort
<i>Pascopyrum smithii</i>	Western wheatgrass
<i>Phleum pratense</i>	Timothy
<i>Phlox hoodii</i>	Hood's phlox
<i>Physaria</i> spp.	Twinpod
<i>Plantago eriopoda</i>	Redwool plantain
<i>Poa juncifolia</i>	Sandberg bluegrass
<i>Poa pratensis</i>	Kentucky bluegrass
<i>Poa</i> spp.	Bluegrass
<i>Poa trivialis</i>	rough bluegrass
<i>Polygonum aviculare</i>	Prostrate knotweed
<i>Polygonum ramosissimum</i>	Bushy knotweed
<i>Potentilla bipinnatifida</i>	Tansy cinquefoil
<i>Potentilla</i> spp.	Cinquefoil
<i>Primula incana</i>	Silvery primrose
<i>Pseudoroegneria spicata</i>	Bluebunch wheatgrass
<i>Puccinellia nuttalliana</i>	Nuttall's alkaligrass
<i>Pyrrocoma lanceolata</i>	Lanceleaf goldenweed
<i>Ranunculus cymbalaria</i>	Alkali buttercup
<i>Rumex crispus</i>	Curly dock
<i>Rumex maritimus</i>	Golden dock
<i>Salix plantifolia</i>	Planeleaf willow
<i>Salsola kali</i>	Russian thistle
<i>Salsola collina</i>	Slender Russian thistle

Scientific Name	Common Name
<i>Salsola</i> spp.	Russian thistle
<i>Sarcobatus vermiculatus</i>	Greasewood
<i>Scirpus americanus</i>	American bulrush
<i>Scirpus nevadensis</i>	Nevada bulrush
<i>Schoenoplectus tabernaemontani</i>	Softstem bulrush
<i>Scutellaria galericulata</i>	Marsh skullcap
<i>Senecio hydrophiloides</i>	Tall groundsel
<i>Sisyrinchium implicatum</i>	Blueeyed grass
<i>Sisyrinchium pallidum</i>	pale blue-eyed grass
<i>Sium suave</i>	Hemlock waterparsnip
<i>Sonchus palustris</i>	Marsh sowthistle
<i>Sparganium</i> spp.	Bur-reed
<i>Sphaeralcea coccinea</i>	Scarlet globemallow
<i>Sporobolus cryptandrus</i>	Sand dropseed
<i>Stuckenia filiformis</i>	Fineleaf pondweed
<i>Stuckenia pectinata</i>	Sago pondweed
<i>Tetradymia canescens</i>	Spineless horsebrush
<i>Townsendia hookeri</i>	Hooker's townsendia
<i>Tragopogon dubius</i>	Yellow salsify
<i>Trifolium hybridum</i>	Alsike clover
<i>Trifolium repens</i>	White clover
<i>Triglochin maritima</i>	Seaside arrowgrass
<i>Triglochin palustris</i>	Marsh arrowgrass
<i>Valeriana edulis</i>	Tobacco root

Appendix G

List of Potentially Occurring Bird Species

The following bird species potentially occur at the Laramie Plains refuges. Species may be found on one or all three refuges.

Scientific Name	Common Name
<i>Accipiter cooperii</i>	Cooper's hawk
<i>Accipiter gentilis</i>	Northern goshawk*
<i>Accipiter striatus</i>	Sharp-shinned hawk*
<i>Actitis macularia</i>	Spotted sandpiper
<i>Aechmophorus clarkii</i>	Clark's grebe
<i>Aechmophorus occidentalis</i>	Western grebe
<i>Agelaius phoeniceus</i>	Red-winged blackbird
<i>Aix sponsa</i>	Wood duck
<i>Anas acuta</i>	Northern pintail
<i>Anas americana</i>	American wigeon
<i>Anas carolinensis</i>	Green-winged teal
<i>Anas clypeata</i>	Northern shoveler
<i>Anas cyanoptera</i>	Cinnamon teal
<i>Anas discors</i>	Blue-winged teal
<i>Anas platyrhynchos</i>	Mallard
<i>Anas strepera</i>	Gadwall
<i>Anthus rubescens</i>	American pipit
<i>Aquila chrysaetos</i>	Golden eagle
<i>Ardea herodias</i>	Great blue heron
<i>Asio flammeus</i>	Short-eared owl*
<i>Athene cunicularia</i>	Burrowing owl*
<i>Aythya affinis</i>	Lesser scaup
<i>Aythya americana</i>	Redhead
<i>Aythya collaris</i>	Ring-necked duck
<i>Aythya marila</i>	Greater scaup*
<i>Aythya valisineria</i>	Canvasback
<i>Bombycilla cedrorum</i>	Cedar waxwing*
<i>Bombycilla garrulus</i>	Bohemian waxwing*
<i>Botaurus lentiginosus</i>	American bittern
<i>Branta canadensis</i>	Canada goose
<i>Bubo virginianus</i>	Great horned owl*
<i>Bubulcus ibis</i>	Cattle egret
<i>Bucephala albeola</i>	Bufflehead
<i>Bucephala clangula</i>	Common goldeneye
<i>Bucephala islandica</i>	Barrow's goldeneye*

Scientific Name	Common Name
<i>Buteo jamaicensis</i>	Red-tailed hawk
<i>Buteo lagopus</i>	Rough-legged hawk
<i>Buteo regalis</i>	Ferruginous hawk
<i>Buteo swainsoni</i>	Swainson's hawk
<i>Butorides virescens</i>	Green heron*
<i>Calamospiza melanocorys</i>	Lark bunting
<i>Calcarius ornatus</i>	Chestnut-collared longspur
<i>Calcarius sandwichensis</i>	McGown's longspur
<i>Calidris alba</i>	Sanderling*
<i>Carduelis pinus</i>	Pine siskin
<i>Carduelis tristis</i>	American goldfinch
<i>Cathartes aura</i>	Turkey vulture
<i>Catharus guttatus</i>	Hermit thrush*
<i>Charadrius montanus</i>	Mountain plover*
<i>Charadrius vociferus</i>	Killdeer
<i>Chen caerulescens</i>	Snow goose*
<i>Chen rossii</i>	Ross's goose*
<i>Chlidonias niger</i>	Black tern
<i>Chondestes grammacus</i>	Lark sparrow
<i>Chordeiles minor</i>	Common nighthawk
<i>Circus cyaneus</i>	Northern harrier
<i>Cistothorus palustris</i>	Marsh wren
<i>Coccothraustes vespertinus</i>	Evening grosbeak*
<i>Colaptes auratus</i>	Northern flicker
<i>Corvus brachyrhynchos</i>	American crow
<i>Corvus corax</i>	Common raven
<i>Cygnus columbianus</i>	Tundra swan
<i>Dendroica coronata</i>	Yellow rumped warbler
<i>Dendroica nigrescens</i>	Black-throated gray warbler*
<i>Dendroica petechia</i>	Yellow warbler
<i>Egretta thula</i>	Snowy egret
<i>Eremophila alpestris</i>	Horned lark
<i>Erolia alpina</i>	Dunlin*
<i>Erolia bairdii</i>	Baird's sandpiper
<i>Erolia mauri</i>	Western sandpiper
<i>Erolia minutilla</i>	Least sandpiper
<i>Euphagus carolinus</i>	Rusty blackbird*
<i>Euphagus cyanocephalus</i>	Brewer's blackbird
<i>Falco mexicanus</i>	Prairie falcon
<i>Falco peregrinus</i>	Peregrine falcon
<i>Fulica americana</i>	American coot

Scientific Name	Common Name
<i>Gallinago delicata</i>	Wilson's snipe
<i>Gavia immer</i>	Common loon
<i>Geothlypis trichas</i>	Common yellowthroat
<i>Grus canadensis tabida</i>	Sandhill crane
<i>Haliaeetus leucocephalus</i>	Bald eagle
<i>Himantopus mexicanus</i>	Black-necked stilt*
<i>Hirundo rustica</i>	Barn swallow
<i>Hydroprogne caspia</i>	Caspian tern*
<i>Larus argentatus</i>	Herring gull*
<i>Larus californicus</i>	California gull
<i>Larus delawarensis</i>	Ring-billed gull*
<i>Larus philadelphia</i>	Bonaparte's gull
<i>Larus pipixcan</i>	Franklin's gull
<i>Lanius ludovicianus</i>	Loggerhead shrike
<i>Leucosticte atrata</i>	Black rosy finch
<i>Leucosticte australis</i>	Brown-capped rosy finch*
<i>Leucosticte tephrocotis</i>	Gray-crowned rosy finch*
<i>Limnodromus scolopaceus</i>	Long-billed dowitcher
<i>Limosa fedoa</i>	Marbled godwit
<i>Lophodytes cucullatus</i>	Hooded merganser*
<i>Melanitta deglandi</i>	White-winged scoter*
<i>Melospiza melodia</i>	Song sparrow
<i>Mergus merganser</i>	Common merganser
<i>Micropalmata himantopus</i>	Stilt sandpiper*
<i>Molothrus ater</i>	Brown-headed cowbird
<i>Numenius americanus</i>	Long-billed curlew*
<i>Numenius phaeopus</i>	Whimbrel*
<i>Nycticorax nycticorax</i>	Black-crowned night-heron
<i>Oreoscoptes montanus</i>	Sage thrasher
<i>Oxyura jamaicensis</i>	Ruddy duck
<i>Passer domesticus</i>	House sparrow
<i>Passerculus sandwichensis</i>	Savannah sparrow
<i>Pelecanus erythrorhynchos</i>	American white pelican
<i>Petrochelidon pyrrhonota</i>	Cliff swallow
<i>Phalacrocorax auritus</i>	Double-crested cormorant
<i>Phalaropus lobatus</i>	Red-necked phalarope
<i>Phalaropus tricolor</i>	Wilson's phalarope
<i>Pica hudsonia</i>	Black-billed magpie
<i>Pipilo chlorurus</i>	Green-tailed towhee
<i>Piranga ludoviciana</i>	Western tanager
<i>Plectrophenax nivalis</i>	Snow bunting*

Scientific Name	Common Name
<i>Plegadis chihi</i>	White-faced ibis
<i>Podiceps auritus</i>	Horned grebe*
<i>Podiceps grisegena</i>	Red-necked grebe*
<i>Podiceps nigricollis</i>	Eared grebe
<i>Podilymbus podiceps</i>	Pied-billed grebe
<i>Poecile atricapilla</i>	Black-capped chickadee
<i>Pooecetes gramineus</i>	Vesper sparrow
<i>Porzana carolina</i>	Sora
<i>Quiscalus quiscula</i>	Common grackle
<i>Rallus limicola</i>	Virginia rail
<i>Recurvirostra americana</i>	American avocet
<i>Riparia riparia</i>	Bank swallow
<i>Salpinctes obsoletus</i>	Rock wren*
<i>Sayornis saya</i>	Say's phoebe
<i>Selasphorus platycercus</i>	Broad-tailed hummingbird
<i>Selasphorus rufus</i>	Rufous hummingbird
<i>Sialia currucoides</i>	Mountain bluebird
<i>Spizella breweri</i>	Brewer's sparrow
<i>Spizella passerina</i>	Chipping sparrow
<i>Stelgidopteryx serripennis</i>	Northern rough-winged swallow
<i>Sterna forsteri</i>	Forster's tern
<i>Sterna hirundo</i>	Common tern*
<i>Sturnus vulgaris</i>	European starling
<i>Sturnella magna</i>	Eastern meadowlark*
<i>Sturnella neglecta</i>	Western meadowlark
<i>Tachycineta bicolor</i>	Tree swallow
<i>Tachycineta thalassina</i>	Violet-green swallow
<i>Toxostoma rufum</i>	Brown thrasher
<i>Tringa flavipes</i>	Lesser yellowlegs
<i>Tringa melanoleuca</i>	Greater yellowlegs
<i>Tringa semipalmata</i>	Willet
<i>Tringa solitaria</i>	Solitary sandpiper
<i>Troglodytes aedon</i>	House wren*
<i>Turdus migratorius</i>	American robin
<i>Tyrannus tyrannus</i>	Eastern kingbird
<i>Tyrannus verticalis</i>	Western kingbird
<i>Xanthocephalus xanthocephalus</i>	Yellow-headed blackbird
<i>Zenaida macroura</i>	Mourning dove*
<i>Zonotrichia leucophrys</i>	White-crowned sparrow

*Signifies rare sighting

Appendix H

List of Potentially Occurring Amphibian and Reptile Species

The following amphibian and reptile species potentially occur at the Laramie Plains refuges. Species may be found on one or more of the three refuges.

Scientific Name	Common Name
Amphibians	
<i>Ambystoma tigrinum</i>	Tiger salamander
<i>Bufo baxteri</i>	Wyoming toad
<i>Phrynosoma platyrhinos</i>	Horned lizard
<i>Pseudacris triseriata maculata</i>	Boreal chorus frog
Reptiles	
<i>Crotalus viridis</i>	Prairie rattlesnake
<i>Pituophis catenifer</i>	Bull snake

Appendix I

List of Potentially Occurring Mammal Species

The following mammals potentially occur at the Laramie Plains refuges. Species may be found on one or more of the three refuges.

Scientific Name	Common Name
<i>Antilocapra americana</i>	Pronghorn
<i>Canis latrans</i>	Coyote
<i>Cervus canadensis</i>	Elk
<i>Chaetodipus hispidus</i>	Hispid pocket mouse
<i>Cynomys leucurus</i>	White-tailed prairie dog
<i>Lepus townsendii</i>	White-tailed jack rabbit
<i>Mephitis mephitis</i>	Striped skunk
<i>Microtus pennsylvanicus</i>	Meadow vole
<i>Mustela frenata</i>	Long-tailed weasel
<i>Mustela vison</i>	Mink
<i>Myotis lucifugus</i>	Little brown myotis
<i>Odocoileus hemionus</i>	Mule deer
<i>Ondatra zibethicus</i>	Muskrat
<i>Perognathus fasciatus</i>	Wyoming pocket mouse
<i>Peromyscus maniculatus</i>	Deer mouse
<i>Procyon lotor</i>	Common raccoon
<i>Reithrodontomys megalotis</i>	Western harvest mouse
<i>Sorex cinereus</i>	Masked shrew
<i>Spermophilus elegans</i>	Wyoming ground squirrel
<i>Spermophilus tridecemlineatus</i>	Thirteen-lined ground squirrel
<i>Sylvilagus audubonii</i>	Desert cottontail
<i>Tamias minimus</i>	Least chipmunk
<i>Taxidea taxus</i>	American badger
<i>Thomomys talpoides</i>	Northern pocket gopher
<i>Vulpes vulpes</i>	Red fox
<i>Zapus hudsonius preblei</i>	Preble's meadow jumping mouse

Appendix J

Draft Compatibility Determination for Wildlife Observation and Wildlife Photography

Uses: Wildlife observation and wildlife photography

Refuge Name: Hutton Lake NWR

County: Albany County, Wyoming

Establishing and Acquisition Authorities:

Migratory Bird Conservation Act, Executive Order 5782

Refuge Purposes:

- “As a refuge and breeding ground for migratory birds and other wild animals.” (Executive Order 5782, dated January 28, 1932)
- “For use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” (16 U.S.C. § 715d [Migratory Bird Conservation Act])

National Wildlife Refuge System Mission

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

Description of Uses

Provide opportunities that support wildlife-dependent recreation.

Wildlife observation and wildlife photography would be allowed year-round. This CCP proposes to continue the above uses and add the following to improve wildlife observation and wildlife photography:

- Update and improve refuge signs.
- Develop visitor services plan.
- Establish a formal parking area with informational kiosks and brochures.
- Provide walk-in access and accessible trails with markers to designate walking trails to the best wildlife viewing areas.

- Close roads where necessary to facilitate implementation of visitor services plan and decrease disturbance to wildlife, discourage illegal hunting, and improve maintenance.
- Update existing refuge informational brochures and wildlife list to Service standards.
- Construct accessible photography blinds on Lake George and Rush and Hutton lakes.
- Provide educational materials on wildlife photography techniques.
- Provide an annual educational opportunity with experienced wildlife photographers sharing their expertise.

The refuge would be open for wildlife observation and wildlife photography. Their supporting use (access) would be controlled and regulated through the publication of refuge “tear sheets” and brochures, and through information posted at the kiosks.

Wildlife observation and wildlife photography are two of the six wildlife-dependent, priority public uses specified in the Improvement Act. These uses and their supporting access-related uses can be allowed at the refuge without interfering with the migratory bird resource.

Availability of Resources

Currently, the programs for wildlife observation and wildlife photography are administered using available resources. Implementing new programs, activities, and facilities outlined in this CCP is tied to funding requests in the form of RONS and SAMMS projects.

Anticipated Impacts of the Uses

Short-term impacts: Temporary disturbance may exist to wildlife near the activity. Direct, short-term impacts may include minor damage from traffic to refuge roads and trails when wet and muddy, minor damage to vegetation, littering, increased maintenance activity, and potential conflicts with other visitors. These activities would have only minor impacts on wildlife and would not detract from the primary purposes of the refuge.

Long-term impacts: None.

Cumulative impacts: There would be no direct or indirect cumulative impacts anticipated with these uses.

Public Review and Comment

This compatibility determination was prepared concurrently with the draft CCP and EA for the refuge. Public review and comment will be achieved concurrently with the public review and comment period for the draft CCP and EA.

Determination

Wildlife observation and wildlife photography, along with their supporting uses, are compatible uses at Hutton Lake NWR.

Stipulations Necessary to Ensure Compatibility

Stipulations regarding the public use program would be made available in published refuge brochures. Dates, closed areas, and other information would be specified:

- Restrict vehicles to designated roads and trails.
- Monitor vehicle use for wildlife disturbance, law enforcement violations, and so forth.
- Monitor use, regulate access, and maintain necessary facilities to prevent habitat degradation and minimize wildlife disturbance.

Justification

Based on the anticipated biological impacts above and in the EA, wildlife observation and wildlife photography on the Hutton Lake NWR would not interfere with the habitat goals and objectives or purposes for which the refuge was established.

Wildlife observation and wildlife photography are priority wildlife-dependent public uses acknowledged in the Improvement Act. These uses promote an appreciation for the natural resources at the refuge. Increased public stewardship will support and complement the Service’s actions in achieving the purposes of the refuge and the mission of the National Wildlife Refuge System.

Signature

Ann Timberman
Project Leader, Arapaho NWR
USFWS, Region 6

Date

Review

Dean Rundle
Refuge Supervisor
USFWS, Region 6

Date

Concurrence

Richard A. Coleman, PhD
Assistant Regional Director
National Wildlife Refuge System
USFWS, Region 6

Date

Mandatory 15-Year Reevaluation Date: 2022



Appendix K

Draft Compatibility Determination for Environmental Education and Interpretation

Use: Environmental education and interpretation

Refuge Name: Hutton Lake NWR

County: Albany County, Wyoming

Establishing and Acquisition Authorities:

Migratory Bird Conservation Act, Executive Order 5782

Refuge Purposes:

- “As a refuge and breeding ground for migratory birds and other wild animals.” (Executive Order 5782, dated January 28, 1932)
- “For use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” (16 U.S.C. § 715d [Migratory Bird Conservation Act])

National Wildlife Refuge System Mission

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

Description of Uses

The uses would be continuation of interpretative and environmental education programs at enhanced and expanded levels. Environmental education consists of activities conducted by refuge staff and partnerships. Interpretation occurs in less formal activities through exhibits, signs, and brochures. Visiting school and nonprofit groups would use the refuge as an outdoor classroom and tour site.

This CCP proposes to continue with the above uses and add the following to improve environmental education and interpretation activities for visitors:

- Update and improve refuge signs.
- Update existing brochures to the Service’s graphic standards.
- In cooperation with University of Wyoming, Wyoming Audubon, and others,

offer scheduled environmental education opportunities at Hutton Lake NWR.

- Create programs for students and volunteers to assist in refuge management activities.
- Provide educational opportunities to local youth organizations such as Boy Scouts and Girl Scouts.

These activities would be held during the daytime, most frequently while school is in session (September–May). Less frequently, nonprofit groups would be hosted during the summer months.

Refuge staff would provide the instruction and host classroom tours in most cases. When someone other than refuge personnel leads activities, a special use permit may be issued.

Interpretation and environmental education are two of the six wildlife-dependent, priority public uses specified in the Improvement Act. These uses can be allowed at the refuge without interfering with the migratory bird resource.

Availability of Resources

Currently, environmental education and interpretation programs are conducted using available resources. Implementing new programs, activities, and facilities outlined in this CCP is tied to funding requests in the form of RONS and SAMMS projects.

Anticipated Impacts of the Uses

Short-term impacts: Minimal disturbance to wildlife and wildlife habitat will result from these uses at the current and proposed levels. Adverse impacts are minimized through careful timing and placement of activities. Wildlife near the activities may experience temporary disturbances. Minor damage to vegetation, littering, and increased maintenance may occur. These activities will have only minor impacts on wildlife and will not detract from the primary purposes of the refuge.

Long-term impacts: These activities would increase local support of the refuge and increase knowledge of stewardship of natural resources to students young and old.

Cumulative impacts: There would be no direct or indirect cumulative impacts anticipated with the continuation of these uses.

Public Review and Comment

This compatibility determination was prepared concurrently with the draft CCP and EA for the refuge. Public review and comment will be achieved concurrently with the public review and comment period for the draft CCP and EA.

Determination

Interpretation and environmental education are compatible uses at Hutton Lake NWR.

Stipulations Necessary to Ensure Compatibility

Allow environmental education and interpretation only in designated areas or under the guidance of refuge staff, partnerships, a volunteer, or a trained teacher to ensure minimal disturbance to wildlife, minimal damage to vegetation, and minimal conflicts between user groups.

Disturbance is almost an unavoidable impact of the interpretive and environmental education programs. However, it is through these activities that visitors would receive an understanding of proper etiquette and the impact people have on habitat and wildlife. This information and refuge-specific regulations would be available through visitor contacts, brochures, and kiosks. Periodic law enforcement would ensure compliance with regulations and area closures.

Justification

Based on the anticipated biological impacts above and in the EA, it is determined that environmental education and interpretation on the Hutton Lake NWR will not interfere with the habitat goals and objectives or purposes for which it was established.

Environmental education and interpretation are priority wildlife-dependent public uses acknowledged in the Improvement Act. These uses promote an appreciation for the natural resources at the refuge. Increased public stewardship will support and complement the Service's actions in achieving the purposes of the refuge and the mission of the National Wildlife Refuge System.

Signature

Ann Timberman
Project Leader, Arapaho NWR
USFWS, Region 6

Date

Review

Dean Rundle
Refuge Supervisor
USFWS, Region 6

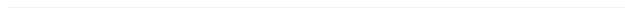
Date

Concurrence

Richard A. Coleman, PhD
Assistant Regional Director
National Wildlife Refuge System
USFWS, Region 6

Date

Mandatory 15-Year Reevaluation Date: 2022



Appendix L

Draft Compatibility Determination for Grazing

Use: Prescribed grazing

Refuge Name: Hutton Lake NWR

County: Albany County, Wyoming

Establishing and Acquisition Authorities:
Migratory Bird Conservation Act, Executive Order 5782

Refuge Purposes:

- “As a refuge and breeding ground for migratory birds and other wild animals.” (Executive Order 5782, dated January 28, 1932)
- “For use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” (16 U.S.C. § 715d [Migratory Bird Conservation Act])

National Wildlife Refuge System Mission

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

Description of Uses

Prescribed grazing is the use of livestock, usually cattle, to remove standing vegetation, reduce vegetative litter, suppress woody vegetation or noxious weeds, open up vegetation-choked wetlands, or open up areas to sunlight and encourage native grass seedlings and growth. Prescribed grazing is carefully timed, and usually of short duration (usually 2–4 weeks), to target certain species for grazing impacts in order to benefit other species for growth after the competing vegetation has been removed.

Due to the arid climate, when it is determined refuge grasslands will benefit from prescribed grazing, this treatment will occur in the fall of the year (July–October). Grazing will be offered on a bid system to interested landowners with stipulations for eligibility. Mid-season grazing (July) removes litter and encourages some fall regrowth. Grazing later in the season (August–October) removes litter and encourages spring vegetation growth. Late-season grazing also concentrates livestock in heavier

vegetation (rushes) in the refuge ponds due to the upland grasse’s curing and becoming less palatable, which can facilitate providing water openings in the vegetation.

Fence construction and maintenance (often a temporary electric fence) and control and rotation of the livestock are the responsibility of the cooperating private party. Market rate grazing fees are determined by the regional office, but may include standard deductions for fence construction and maintenance, frequent livestock rotations, construction of water gaps, or hauling/providing additional water in dry pasture.

The frequency and duration of prescribed grazing on the refuge will be based on site-specific evaluations of the grassland being managed.

This CCP proposes to continue with the above use and add the following to improve management of refuge upland habitats:

- Conduct upland vegetation surveys.
- Evaluate grazing program to determine appropriate stocking rates, duration, and so forth of grazing program.
- Install and maintain fencing to appropriately manage grazing program.

Availability of Resources

Developing grazing plans and special use permits (SUPs) and monitoring compliance and biological effects require some Service resources. Most grazing management costs (fencing labor, monitoring and moving livestock, hauling water) are provided by the cooperator or permittee. Evaluating the grasslands for grazing prescriptions and grassland response is already a part of the refuge grassland management responsibilities. Some alternative form of grassland management, prescribed burning or haying, may be used if the areas are not treated with prescribed grazing. Managing grasslands through permitted haying has comparable costs to managing a prescribed grazing program. Managed mowing would be more expensive, since all labor costs would be assumed by the Service. Prescribed fire can be an effective grassland management tool, but there are personnel and weather limitations on a burning program, as well the fact that some tracts are not suited to burning management. In addition, there is an ecological benefit to rotating grassland management techniques, such as grazing, burning, and haying, at different seasons, rather than just relying on one technique.

Anticipated Impacts of the Uses

Short-term impacts: Grazing by domestic livestock has the short-term effect of removing some or much of the standing vegetation from a tract of grassland. Properly prescribed, the effect of this removal of vegetation increases the vigor of the grassland, stimulates the growth of desired species of grass and forbs, and reduces the abundance of targeted species such as cool-season exotics, woody species, noxious weeds or invasive species, or cattails. Grazing in the spring may cause the loss of some bird nests due to trampling, and may cause some birds not to nest in areas being grazed. Grazing on public wildlife lands can create an aesthetic issue of concern for some people or visitors who do not understand grassland management. Prescribed grazing is usually of short duration and enhanced, most diverse and vigorous grassland habitats are the end result. Grazing livestock may create a minor and temporary disturbance to wildlife, but generally do no harm. There is a slight potential for conflict between the visiting public and the livestock or the permittee.

Public Review and Comment

This compatibility determination was prepared concurrently with the draft CCP and EA for the refuge. Public review and comment will be achieved concurrently with the public review and comment period for the draft CCP and EA.

Determination

As this activity is an economic use, it must meet the compatibility threshold of “contributing to the Mission and Purposes” of the Refuge System and refuge area. Prescribed grazing is used to improve and manage grassland habitats on refuges and benefit the migratory birds and other wildlife that use these habitats.

The use of grazing as a habitat management tool is compatible at Hutton Lake NWR with the following stipulations.

Stipulations Necessary to Ensure Compatibility

- SUPs will specify the stocking rates, dates of use, and timing for each unit or grazing cell on the refuge.
- The standard grazing fee, as determined for each state by the regional office, and any standard deductions for any labor or work done on Service lands will be included on the SUP.
- Grazing permittees must comply with all applicable State Livestock Health Laws.

- No supplemental feeding will be allowed without authorization from the project leader/refuge manager.
- Control and confinement of livestock will be the responsibility of the permittee.
- The permit is issued subject to the revocation and appeals procedure contained in Title 50, Part 25 of the Code of Federal Regulations.

Justification

Controlled grazing by domestic livestock will not materially interfere or detract from the purposes for which the refuge was established. Prescribed livestock grazing creates temporary disturbances to vegetation. Many of these disturbances are desirable for grassland management. Grazing produces an undesirable, but short-term impact to grassland nesting birds and site aesthetics. In the long term, prescribed grazing increases grassland vigor, species diversity, and habitat quality. Prescribed grazing is an alternative management tool that can be used to replace or complement prescribed fire, mowing, or haying of Service grasslands. Without periodic disturbance caused by grazing the health of the grassland community would decline.

Signature

 Ann Timberman
 Project Leader, Arapaho NWR
 USFWS, Region 6

 Date

Review

 Dean Rundle
 Refuge Supervisor
 USFWS, Region 6

 Date

Concurrence

 Richard A. Coleman, PhD
 Assistant Regional Director
 National Wildlife Refuge System
 USFWS, Region 6

 Date

Mandatory 10-Year Reevaluation Date: 2017

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