

Draft Comprehensive Conservation Plan and Environmental Assessment

Lost Trail National Wildlife Refuge

July 2005

Prepared by the U.S. Fish and Wildlife Service

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Summary

Lost Trail National Wildlife Refuge is a breathtakingly beautiful area nestled in the Pleasant Valley in northwestern Montana. The refuge was established in 1999 as the 519th refuge in the National Wildlife Refuge System of the U.S. Fish and Wildlife Service.

The refuge was created as the result of a settlement for habitat and wildlife losses on the Flathead Waterfowl Production Area, attributed to past and future operations of Kerr Dam.



Ray Washtrak/USFWS

Pond near refuge headquarters.

The National Wildlife Refuge System Improvement Act requires that a comprehensive conservation plan be developed for every refuge in the System by 2012. This draft plan describes how Lost Trail National Wildlife Refuge would be managed during the next 15 years to fulfill its congressionally designated purposes.

Lost Trail National Wildlife Refuge was established for...

- use by migratory birds, with emphasis on waterfowl and other water birds
- the conservation of fish and wildlife resources
- fish and wildlife-oriented recreation
- the conservation of endangered or threatened species

[Purposes are drawn from the Migratory Bird Conservation Act, Fish and Wildlife Act, and Refuge Recreation Act.]

The 9,225-acre refuge is located approximately 20 miles northwest from the town of Marion (southwest of Kalispell), in Flathead County.

HABITAT

This jewel of the Refuge System can best be described as a long valley crossed by Pleasant Valley Creek and encompassing the 182-acre Dahl Lake. The refuge encompasses wetlands, lush riparian corridors, uplands dominated by prairie and tame grasses, and temperate forests dominated by lodgepole pine and Douglas-fir.

Wetlands have been altered by water impoundments, which created cropland and grazing opportunities. The channelized nature of some streams, altered for flood protection and irrigation, has removed them from their historic condition and function.

WILDLIFE

Mallard, lesser scaup, shoveler, teal, and Canada geese are common breeders on the refuge. Fall waterfowl populations are low. Neotropical migratory birds such as bluebirds nest on the refuge. Grassland birds show population declines, likely due to habitat loss.

Deer populations have increased, and approximately 300 elk winter on the refuge.

Most fish found in Pleasant Valley Creek show stunting. Although none occur presently, it is likely the creek historically supported redband and westslope cutthroat trout.

Species of concern that reproduce on the refuge include the bald eagle (federally threatened), black tern, boreal toad, and Spalding's catchfly (federally threatened). Canada lynx (federally threatened) and trumpeter swan occasionally use refuge habitats. Grizzly bear, gray wolf, and bull trout, all federally threatened, occur in Pleasant Valley.

Native American occupation sites have been documented, and two of three historical ranch sites are eligible for nomination to the National Register of Historic Places.

Current use of the refuge includes wildlife observation and photography, environmental education, and hunting of deer, elk, mountain grouse, and turkey.

Located in one of the fastest-growing counties in Montana, ranching, recreation, and timber harvest are the main land uses near the refuge.

THE PLANNING PROCESS

The environmental analysis process—as directed by the National Environmental Policy Act—is being followed to develop the comprehensive conservation plan for the refuge.



Chris Servheen/USFWS

Grizzly bears are one of the federally threatened species that occur in Pleasant Valley.

Public, partner, and agency involvement was coordinated by the refuge planning team. During the scoping process, five major issues were raised by refuge staff; Montana Department of Fish, Wildlife and Parks; other federal agencies; refuge partners and neighbors; and the general public:

Habitat Management—Strong support and concern exists for the control or eradication of invasive plants. Grazing practices and intensity are generally issues. Water rights and loss of water downstream due to refuge restoration projects are of concern.

Wildlife Management—The public advocates strongly for giving wildlife and their habitat foremost consideration. Management for conservation of the grizzly bear and gray wolf need to minimize conflicts with humans.

Traditional Use—Social concerns for the loss of a working ranch surrounded the acquisition of the ranch. The Confederated Salish and Kootenai Tribes are concerned that refuge management activities not harm cultural sites. The Service may accommodate Native American traditional use, while maintaining the integrity of the refuge.

Public Use—Public use was considered highly desirable, yet many wanted it managed in a way that did not degrade wildlife habitat. Hunting, trapping, and access are desired by some commenters. Photography, nature trails, and fishing are popular requests. Some individuals would like to see no recreational uses allowed.

Administration—The public was concerned about facilities, refuge expansion outside of designated boundaries, and adequate refuge staffing.

This vision for the refuge is based on the establishment purposes of the refuge, resource conditions and potential, and the issues.

Refuge Vision

Lost Trail National Wildlife Refuge is an integral part of the Columbia River ecosystem and the Pleasant Valley community.

The refuge is a place where wetlands, streams, native grasslands, and forests have been conserved, enhanced, and restored. These habitats support a variety of migratory birds, species of concern, and other associated wildlife and plants.

People learn about and appreciate the natural and cultural environment of the refuge and enjoy opportunities for wildlife-dependent recreation.

Partnering with others fosters natural and cultural resource conservation for the benefit of present and future generations.

These goals were developed to guide achievement of the vision.

- **Riparian Habitat Goal.** Restore, enhance, and maintain a mixed deciduous and coniferous riparian habitat to support indigenous wildlife species and perpetuate the ecological integrity of the Fisher River watershed.
- **Wetland Habitat Goal.** Provide breeding, resting, and feeding habitat for wetland-dependent species of northwestern Montana by restoring, maintaining, and enhancing a mosaic of lake, semipermanent, seasonal, temporary, and saturated wetlands.
- **Grassland Habitat Goal.** Restore, enhance, and maintain Intermountain grasslands, with an emphasis on native bunchgrass prairie to provide habitat for migratory birds, species of concern, and associated wildlife species.
- **Forest Habitat Goal.** Enhance and maintain Douglas-fir, ponderosa pine, aspen, and cottonwood forested habitats within the context of the Fisher River watershed for migratory birds, species of concern, and other associated wildlife species.
- **Invasive Plant Goal.** Native plant communities exist without degradation by invasive plants.
- **Migratory Bird Goal.** Preserve, restore, and enhance the ecological diversity and abundance of migratory birds of the Intermountain West forest, wetland complexes, riparian habitat, and bunchgrass prairie.

- **Other Wildlife Goal.** Restore and maintain resident and endemic wildlife populations of northwestern Montana to maintain and enhance species diversity of Lost Trail National Wildlife Refuge and Pleasant Valley.
- **Species of Concern Goal.** Contribute to the conservation, enhancement, and recovery of endangered, threatened, and species of concern populations in Lost Trail National Wildlife Refuge and Fisher River watershed.
- **Cultural Resource Goal.** Protect, manage, and interpret archaeological, cultural, and historical resources present at Lost Trail National Wildlife Refuge for the benefit of present and future generations.
- **Public Use Goal.** Provide quality wildlife-dependent recreational and educational opportunities for persons of all abilities to learn, understand, and enjoy the Intermountain ecosystem of northwestern Montana; its associated fish, wildlife, and plants of Lost Trail National Wildlife Refuge; and the National Wildlife Refuge System in a safe and compatible manner.
- **Administration Goal.** Provide staffing, funding, and facilities to maintain the long-term integrity of habitats and wildlife resources of Lost Trail National Wildlife Refuge in supporting the achievement of ecosystem and National Wildlife Refuge System goals.
- **Partnership Goal.** Promote and develop partnerships with adjacent landowners, public and private organizations, and other interested individuals to preserve, restore, and enhance a diverse and productive ecosystem of which Lost Trail National Wildlife Refuge is an integral part.



Ray Washtrak/USFWS

Elk hunters find success on the refuge.

DECISIONS TO BE MADE

Based on the analysis documented in this EA, the following decisions will be made by the regional director for region 6 of the Service.

The type and extent of management and public access that will occur on the Lost Trail National Wildlife Refuge.

Whether or not the management and public access on the Lost Trail National Wildlife Refuge would have a significant impact on the quality of the human environment.

ALTERNATIVES

The environmental assessment describes four alternatives for achieving the above goals.

Alternative A (the Service's proposed action) comprises the draft comprehensive conservation plan, and proposes habitat restoration through full staffing; along with increased, compatible public use that is limited when needed to protect wildlife, habitats, and cultural resources.

This alternative would manage refuge habitats through:

- restoration of native vegetation, especially prairie grasses and forest;
- restoration of the natural hydrology of Dahl Lake, Pleasant Valley Creek, and wetlands;
- control of invasive plants.

Migratory and other birds, large and small mammals, amphibians, reptiles, and fish would inhabit quality habitats where they could feed, loaf, rest, and reproduce. Species of concern, especially federally listed species, would receive adequate protection and find their life cycle needs met when migrating through or recolonizing the area of the refuge.

In alternative A, known cultural resources would be protected, while the refuge pursues partnerships and coordination with the state to research and catalog unknown cultural resources.

Compatible public use would receive a boost, especially the priority wildlife-dependent uses:

- Hunting
- Fishing
- Wildlife observation
- Wildlife photography
- Interpretation
- Environmental education

The refuge would pursue administrative independence from the National Bison Range, as well as funding for seven full-time employees to manage the refuge and its waterfowl production

area. A contact station would provide information services for visitors.

Alternative B, while similar to the proposed action, would maximize compatible public use instead of pursuing habitat restoration. Habitats and wildlife would receive adequate protection, but public use would be ensured at the highest possible level.

Alternative C is similar to the proposed action in its emphasis on habitat restoration and wildlife protection, but dissimilar in its emphasis on very restricted public uses to ensure resource protection. Six employees would carry out refuge management. There would be no visitor contact station.

Alternative D (no action) calls for continued, custodial management of the refuge with only one full-time and one part-time employee. While all alternatives would maintain partnerships and foster new ones, this alternative depends the most on partnerships to accomplish most managerial tasks. Habitat restoration and management of invasive plants would be minimally accomplished. There would be no visitor contact station.



The Orr-Gardiner Ranch, part of Lost Trail Ranch and now the refuge, is eligible for nomination to the National Register of Historic Places.

1 Purpose and Need

This document presents an environmental assessment (EA) that evaluates alternatives for, as well as expected consequences of, management of the Lost Trail National Wildlife Refuge in northwestern Montana (figure 1).

The draft comprehensive conservation plan (CCP) for the refuge is described in alternative A (chapter 4).

Although the refuge currently manages McGregor Meadows Waterfowl Production Area (WPA), the draft plan does not address management of the WPA.

The National Wildlife Refuge System Administration Act, as amended by the National Wildlife Refuge System Improvement Act of 1997 (Improvement Act), requires that CCPs be in place for all national wildlife refuges within 15 years of enactment (2012).

A CCP is needed to guide the conservation and use of resources on the newly established (1999) Lost Trail National Wildlife Refuge for the next 10–15 years.



Ray Washiak/USFWS

Wetlands along the tour route at Lost Trail National Wildlife Refuge.

In general, a CCP serves to do the following:

- Ensure that the purpose of the refuge and mission of the National Wildlife Refuge System are being fulfilled.
- Ensure that national policy direction is incorporated into refuge management.
- Ensure that opportunities are available for interested parties to participate in the development of management direction.
- Provide a systematic process for making and documenting refuge decisions.

- Establish broad strategies for refuge programs and activities.
- Provide a basis for evaluating accomplishments.

AGENCY GUIDANCE

The U.S. Fish and Wildlife Service (Service, USFWS) is the principal agency responsible for conservation of our Nation's fish, wildlife, and plant resources. This responsibility is shared with other federal agencies and state and tribal governments.

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

The Service manages a diverse network of more than 540 national wildlife refuges within the National Wildlife Refuge System, which encompasses 95 million acres of lands and waters. Lost Trail is 1 of 22 national wildlife refuges in Montana.

The mission of the National Wildlife Refuge System is to administer a 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.

Operation and management of national wildlife refuges are influenced by a wide array of laws, treaties, and executive orders (see appendix A). The primary guidance comes from these laws:

- National Wildlife Refuge System Administration Act of 1966, as amended
- National Wildlife Refuge System Improvement Act of 1997 (Improvement Act)

All national wildlife refuges are established with the following goals (Service Director's Order No. 132):

- Fulfill our statutory duty to achieve refuge purpose(s) and further the Refuge System mission.

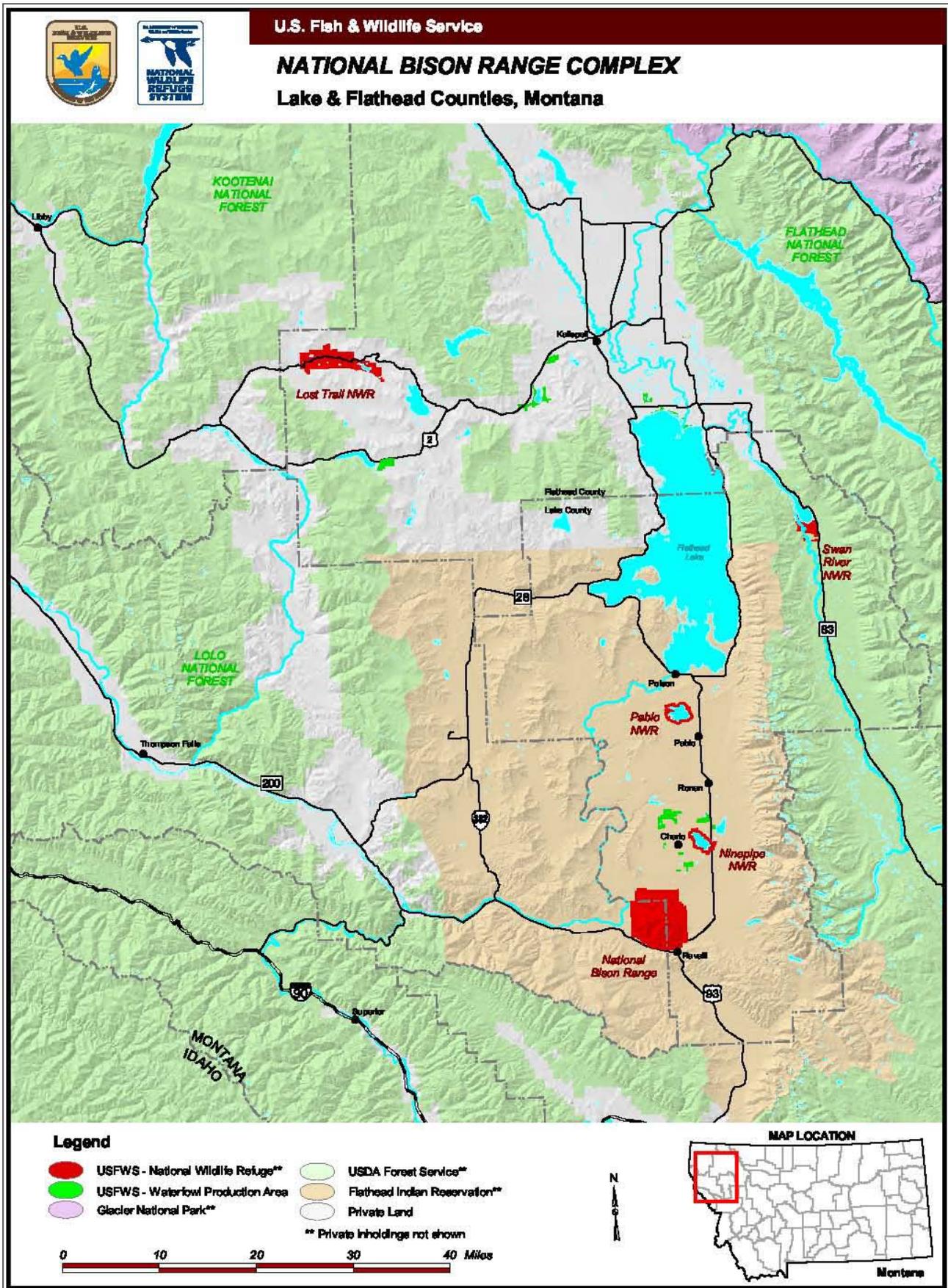


Figure 1. Vicinity map for Lost Trail National Wildlife Refuge, Montana

- Conserve, restore where appropriate, and enhance all species of fish, wildlife, and plants that are endangered or threatened with becoming endangered.
- Perpetuate migratory bird, inter-jurisdictional 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, quality, and compatible wildlife-dependent public use. Such use includes hunting, fishing, wildlife observation and photography, environmental education, and interpretation.

These goals help step-down the Refuge System mission and principles of the 1997 amendments to the National Wildlife Refuge System Administration Act. These goals articulate the foundation for stewardship of the Refuge System and define the unique niche it occupies among various federal land systems.

The Improvement Act calls for making opportunities for wildlife-dependent recreation, as long as they are compatibly managed with other purposes and do not conflict with other use. Service policy allows use if it is appropriate (appendix A).

An appropriate use:

- contributes to the Refuge System mission, the refuge's major purposes, or refuge goals or objectives;
- is a priority wildlife-dependent public use (fishing, hunting, wildlife observation and photography, environmental education, and interpretation); or
- supports the safe and effective conduct of a priority public use.

It is the policy of the federal government—in cooperation with other nations and in partnership with states, local governments, Indian tribes, and private organizations and individuals—to administer federally owned, administered, or controlled prehistoric and historic resources in a spirit of stewardship for the benefit of present and future generations.

To maintain the health of individual national wildlife refuges, and the Refuge System as a whole, managers must anticipate future conditions—to avoid adverse effects and take positive actions to conserve and protect refuge resources. Effective management also depends on knowledge of larger systems and resource relationships.

REFUGE OVERVIEW

Lost Trail National Wildlife Refuge was established on August 24, 1999, and became the 519th refuge in the National Wildlife Refuge System.

PURPOSES

The purposes for the refuge are set out in the authorities for acquisition (below), as summarized here.

Lost Trail National Wildlife Refuge was established for...

use by migratory birds, with emphasis on waterfowl and other water birds

the conservation of fish and wildlife resources

fish- and wildlife-oriented recreation

the conservation of endangered or threatened species

Management is dictated, in large part, by legislation that created the refuge and defines the purposes for which the refuge was established. Four authorities exist for the acquisition and establishment of the refuge:

- Migratory Bird Conservation Act "...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.

Habitat management needs to maintain a mosaic of plant communities for a diversity of foraging and nesting migratory birds. Plant communities need to be managed for a variety of cover conditions and water levels, with areas of disturbance minimized.

- The Fish and Wildlife Act, "...for the development, advancement, management, conservation, and protection of fish and wildlife resources..."
- The Refuge Recreation Act, "...for (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species..."
- The Fish and Wildlife Coordination Act, "...for the conservation and enhancement of fish and wildlife."

Parts of the refuge are mitigative properties [obtained from the Montana Power Company (MPC) in lieu of losses to Flathead WPA attributed to past and future operations of Kerr Dam). The purpose is to protect and maintain wetland habitat for migratory birds, other animals, and plants; to

restore flood plain acreage to its historic role; and to enhance the survival prospects of endangered and threatened species.

VISION

Lost Trail National Wildlife Refuge is an integral part of the Columbia River ecosystem and the Pleasant Valley community.

The refuge is a place where wetlands, streams, native grasslands, and forests have been conserved, enhanced, and restored. These habitats support a variety of migratory birds, species of concern, and other associated wildlife and plants.

People learn about and appreciate the natural and cultural environment of the refuge and enjoy opportunities for wildlife-dependent recreation.

Partnering with others fosters natural and cultural resource conservation for the benefit of present and future generations.

GOALS

A goal is a descriptive, broad statement of desired future conditions that conveys a purpose, but does not define measurable units. Goals for the refuge will direct work at carrying out the refuge's mandates and achieving the purposes.

These goals are derived from the vision statement and the refuge's purposes to reflect the refuge's contribution to the Refuge System.

The following goals for the refuge reflect the core mission of the Service to protect fish, wildlife, and plant resources while providing compatible opportunities for the public to appreciate and enjoy the natural environment of the region.

RIPARIAN HABITAT GOAL

Restore, enhance, and maintain a mixed deciduous and coniferous riparian habitat to support indigenous wildlife species and perpetuate the ecological integrity of the Fisher River watershed.

WETLAND HABITAT GOAL

Provide breeding, resting, and feeding habitat for wetland-dependent species of northwestern Montana by restoring, maintaining, and enhancing a mosaic of lake, semipermanent, seasonal, temporary, and saturated wetlands.

GRASSLAND HABITAT GOAL

Restore, enhance, and maintain Intermountain grasslands, with an emphasis on native bunchgrass prairie to provide habitat for migratory birds, species of concern, and associated wildlife species.

FOREST HABITAT GOAL

Enhance and maintain Douglas-fir, ponderosa pine, aspen, and cottonwood forested habitats within the context of the Fisher River watershed for migratory birds, species of concern, and other associated wildlife species.

INVASIVE PLANT GOAL

Native plant communities, composition, occurrence, and density exist without degradation by invasive plants, and support associated wildlife.

MIGRATORY BIRD GOAL

Preserve, restore, and enhance the ecological diversity and abundance of migratory birds of the Intermountain West forest, wetland complexes, riparian habitat, and bunchgrass prairie.

OTHER WILDLIFE GOAL

Restore and maintain resident and endemic wildlife populations of northwestern Montana to maintain and enhance species diversity of Lost Trail National Wildlife Refuge and Pleasant Valley.

SPECIES OF CONCERN GOAL

Contribute to the conservation, enhancement, and recovery of endangered, threatened, and species of concern populations in Lost Trail National Wildlife Refuge and Fisher River watershed.

CULTURAL RESOURCE GOAL

Protect, manage, and interpret archaeological, cultural, and historical resources present at Lost Trail National Wildlife Refuge for the benefit of present and future generations.

PUBLIC USE GOAL

Provide quality wildlife-dependent recreational and educational opportunities for persons of all abilities to learn, understand, and enjoy the Intermountain ecosystem of northwestern Montana; its associated fish, wildlife, and plants of Lost Trail National Wildlife Refuge; and the National Wildlife Refuge System in a safe and compatible manner.

ADMINISTRATION GOAL

Provide staffing, funding, and facilities to maintain the long-term integrity of habitats and wildlife resources of Lost Trail National Wildlife Refuge in supporting the achievement of ecosystem and National Wildlife Refuge System goals.

PARTNERSHIP GOAL

Promote and develop partnerships with adjacent landowners, public and private organizations, and other interested individuals to preserve, restore, and enhance a diverse and productive ecosystem of which Lost Trail National Wildlife Refuge is an integral part.

MANAGEMENT CONSIDERATIONS

This section describes other management considerations for habitats, wildlife, and administration of the refuge.

HABITATS

The wetland reserve program (WRP) project has the following goals that relate to Pleasant Valley Creek:

- Address habitat needs for a diversity of fish and wildlife with a priority for species most impacted by degraded condition; beaver; moose; and species of concern such as bull, westslope cutthroat, and redband trout.
- Restore wetland hydrology and vegetation to historic conditions.
- Restore streams to historic channels and/or function, where feasible.
- Restore fisheries habitat and aid fish passage to tributary channels, where feasible.

Although management of forest habitat is not a priority for the refuge, as a wildlife steward, the Service needs to determine what is within refuge boundaries and not impact species of concern and their biological potential.

WILDLIFE

The refuge is challenged with managing for predator species along with other native species. Although predators are of secondary importance after native birds for management to meet refuge purposes, they are critical to maintaining ecosystem health and are popular with refuge visitors.

Specific objectives have not been developed for upland game birds, because it is expected that habitat objectives would benefit these species.

The Service is required to carry out conservation (recovery) programs for listed species and to ensure that agency actions are not likely to jeopardize the continued existence of listed species or adversely modify or destroy their critical habitat. The grizzly bear is important, but not the primary user of the refuge. The refuge would not be managed exclusively for the grizzly bear at the expense of other priority species.

The refuge contains only marginal habitat for Canada lynx; even intensive management for lynx habitat may not result in lynx using the refuge. When conflicts arise, the needs of lynx may not be the primary consideration in habitat management.

PUBLIC USE

Hunting, fishing, wildlife observation and photography, environmental education, and interpretation are

priority public uses of the Refuge System, when compatible with the main mission of wildlife conservation (Improvement Act).

The Service's stewardship responsibilities will ensure that priority uses, when found compatible, will receive enhanced and highest consideration in refuge planning and management over other general public uses.

ADMINISTRATION

House Report 105–106 (accompanying the House of Representatives version of the Improvement Act) encourages refuge managers to take reasonable steps to obtain outside assistance if adequate finances are not available to manage a priority use in a compatible manner.

Refuge staff needs to work closely with state, community, and conservation partners to help obtain resources to manage priority uses.

BACKGROUND

In 1985, the Service evaluated ecosystem and Refuge System needs in Flathead and Lake counties, Montana, and prepared a land acquisition and development plan. The plan identified more than 11,000 acres of wetlands and uplands in Flathead Valley that would be suitable for wetland-dependent wildlife production and management. Dahl Lake and surrounding habitats were identified.



Dave Menke/USFWS

Lesser scaup are common nesters on the refuge.

The establishment of much of the refuge was the result of a mitigative settlement between the MPC, the Confederated Salish and Kootenai Tribes (CSKT), and the Service. A summary follows, with details found in appendix A.

The MPC operated Kerr Dam, a hydro-generating facility located on the Flathead River. In 1985, the Federal Energy Regulatory Commission (FERC) identified hydro-project impacts to aquatic and wildlife resources on the Service-administered Flathead WPA at the north end of Flathead Lake.

In 1997, FERC issued a settlement order that required the MPC to acquire 3,911 acres of suitable replacement habitat as mitigation for wildlife losses and impacts on the WPA. The MPC purchased the Lost Trail Ranch with the intent of conveying 3,112 acres to the Service. Two parcels of the ranch were identified as mitigative replacement habitat (figure 2):

- Dahl Lake (160 acres) with 2,452 acres of surrounding habitat
- Restorable wetlands (500 acres) on the west end of the ranch

There is a habitat development plan for the refuge as part of this FERC-approved settlement. The plan addresses habitat enhancements on the refuge for mitigation of habitat and wildlife losses.

After review of the proposed parcels, and in consideration of other wildlife needs, the Service proposed acquisition of the remaining ranch tracts for establishment of a national wildlife refuge. In 1998, a preliminary project proposal, conceptual management plan, and environmental assessment for acquisition were prepared.

The conceptual management plan provided a general description of the operations and management for the newly established refuge, as outlined in the

preferred alternative of the environmental assessment for the creation of the refuge.

During the interim acquisition period (1998–1999), the Natural Resources Conservation Service (NRCS), in conjunction with the MPC, acquired a WRP easement on 1,770 acres of the ranch (figure 3). This easement allows for the restoration of the hydrology of the area.

The refuge acquisition was completed on August 24, 1999, by the realty division at the Service's region 6 headquarters (Lakewood, Colorado).

The 2001 decision to allow hunting at the refuge followed the completion of an environmental assessment for hunting options, strategies, and effects (details in appendix A).

When considering other uses, the refuge manager will prepare a compatibility determination when necessary. Appendix B displays the compatibility determination for the refuge.

Wildlife-dependent recreational use programs will be offered only to the extent that staff, funds, and facilities are sufficient to develop and operate programs to safe, quality standards.

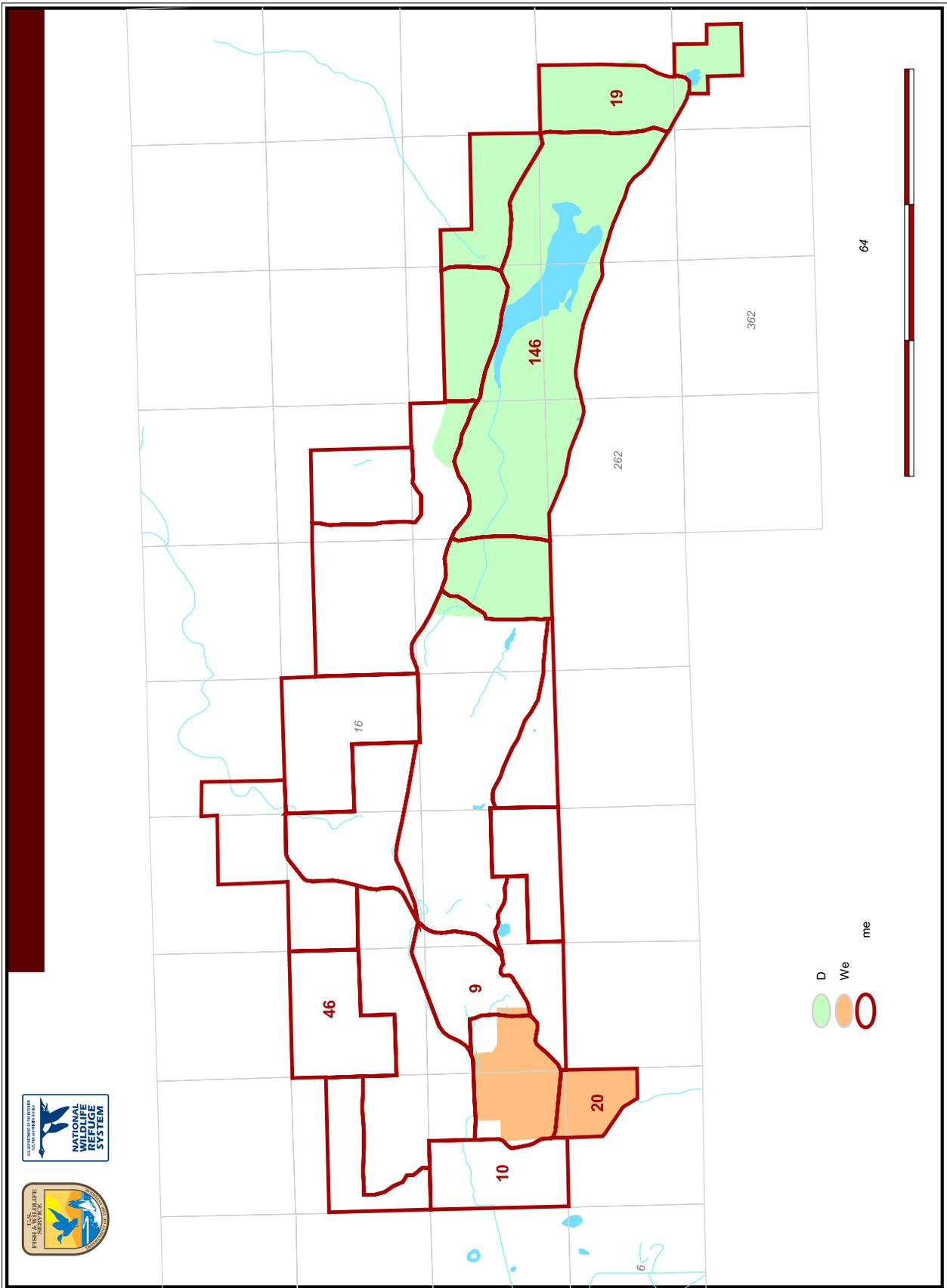


Figure 2. Management units for Lost Trail National Wildlife Refuge, Montana

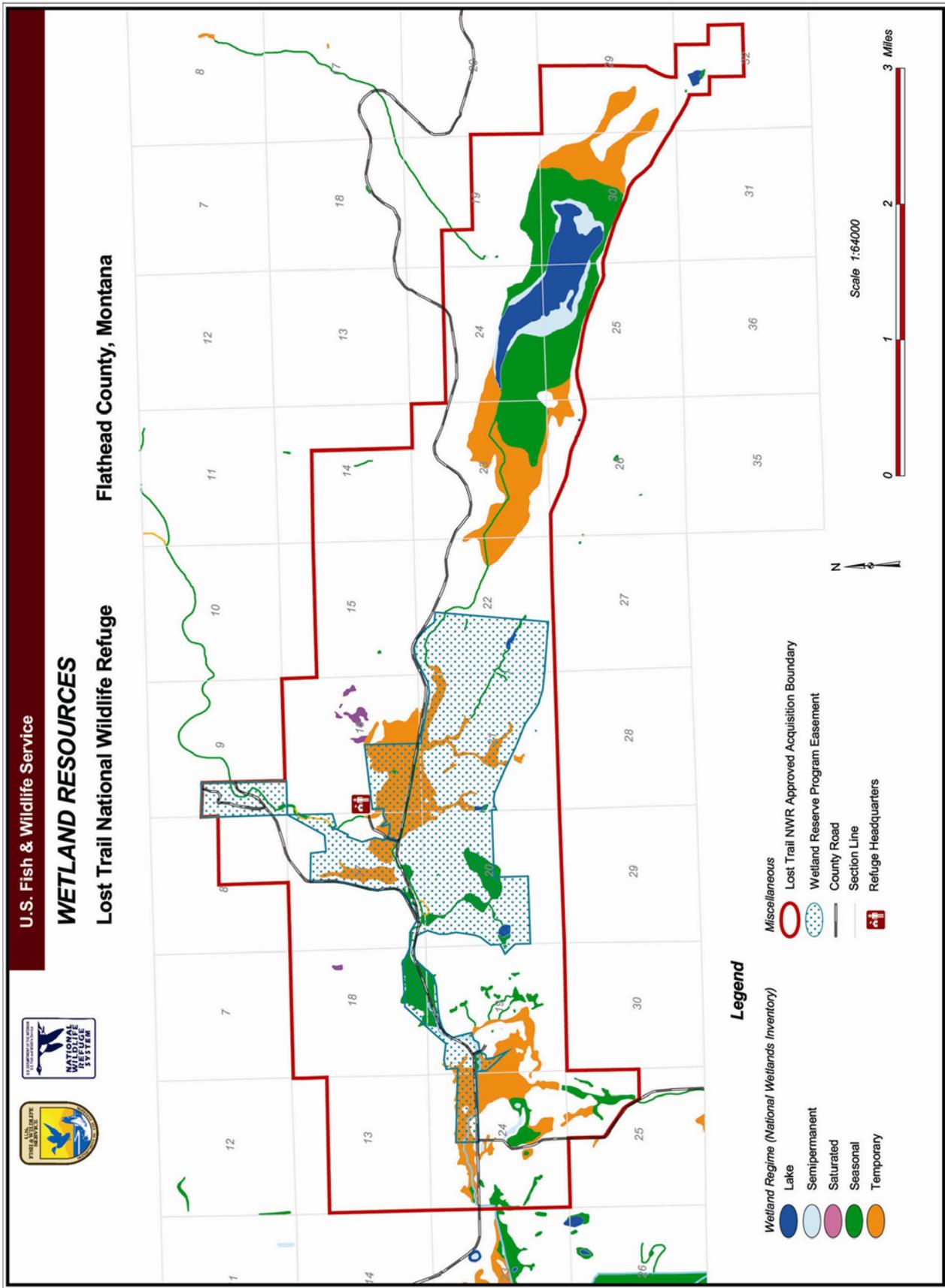


Figure 3. Wetland resources of Lost Trail National Wildlife Refuge, Montana

2 The Planning Process

The Improvement Act directs the Service to manage refuges in accordance with an approved CCP.

This section describes the planning process and issues specific to Lost Trail National Wildlife Refuge.

THE PROCESS

The Service is following the planning steps below to determine the future management of the refuge, in a thorough manner that meets requirements of the National Environmental Policy Act (NEPA) and Service policy.

The CCP process consists of a series of steps that are displayed sequentially; however, CCP planning, with NEPA analysis and documentation, occur simultaneously. Although public involvement is listed as part of two steps, the Service will take public input at any point in the planning process.

- Preplanning (form a planning team, review available data, organize efforts)
- Initiate public involvement and scoping (public input gathered on issues)
- Develop draft vision and goal statements
- Develop and analyze draft alternatives, including a proposed action (includes developing draft objectives)
- Prepare documentation of the NEPA analysis, including the draft plan (proposed action alternative)
- Conduct internal review (Service, state, and tribal partners) and gather public input on draft document
- Analyze and respond to public comments
- Select one of the alternatives, which becomes the CCP
- Make revisions as necessary and prepare the final CCP
- Approve and carry out the CCP
- Monitor and evaluate actions and results

The planning team (described in appendix C) for the CCP is carrying out the process, and has prepared this draft CCP and EA.

Coordination with the public, local groups, and other agencies has been essential in developing a realistic, meaningful plan. A summary of this consultation and coordination is in appendix D.

DECISIONS TO BE MADE

Based on the analysis documented in this EA, the following decisions will be made by the Service's regional director for region 6 (Mountain–Prairie Region), headquartered in Lakewood, Colorado.

The type and extent of management and public access that will occur on the Lost Trail National Wildlife Refuge.

Whether or not the management and public access on the Lost Trail National Wildlife Refuge would have a significant impact on the quality of the human environment.

DOCUMENTATION

As part of the Service's decision-making process, this EA has been developed in accordance with the NEPA. Four alternatives provide options for addressing management concerns and for resolving public issues. The draft CCP for the refuge is described in alternative A (the Service's proposed action).

This document displays the results of planning to date to develop the CCP. It includes a description of the existing environment on the refuge, alternatives for management, and an assessment of the effects of carrying out the alternatives.

STEP-DOWN PLANS

Step-down management plans describe how specific strategies in the approved CCP will be carried out—and include schedules for management subjects (e.g., habitat, public use, fire, and safety) or groups of related subjects—to meet CCP goals and objectives.

One step-down management plan has already been completed—the hunt plan, which was completed to open the refuge to hunting starting the fall 2002 season (see details about the environmental analysis in appendix A).



John Steinhilber/USFWS

White-tailed Deer

After the CCP is completed, six additional step-down plans will need to be developed or modified:

- Occupational safety and health—*required*
- Inventory and monitoring of populations—*required*
- Habitat management practices—*required*
- Fire management—*required*
- Invasive species management
- Public use
- Habitat management plan

PLAN REVISION

Plans are dynamic—management strategies need to be reviewed and updated periodically. The CCP will be reviewed at least annually to determine if it requires any revisions.

Monitoring and evaluation will determine whether management activities are achieving the refuge purposes, vision, and goals. When significant new information becomes available, ecological conditions change, major refuge expansion occurs, or other needs are identified, the CCP can be revised.

Revision should occur, at a minimum, every 15 years. If the plan requires a major revision, the CCP process starts anew. Plan revisions require NEPA compliance. The public will continue to be informed of and involved with any revision to the CCP.

PUBLIC INVOLVEMENT

The NEPA process is being used by the Service to engage the public in refuge planning, while determining whether the proposed action for management of the refuge would have significant effects.

Scoping is the term for requesting input from the public, in this case, regarding management of a refuge. The primary thrust for the planning process is to provide a forum for ideas and issues to be shared, reviewed, and evaluated among agency staff and the public.

Comments are reviewed to identify issues—public concerns about or advocacies for future management of the refuge. These issues are addressed in the CCP, other plans, and decision documents.

Public scoping was initiated in January 1998, when issue workbooks were mailed and open houses were held for public input on management for all the refuges of the National Bison Range complex. An open house was held in March 2001 to request public comment on hunting at the refuge. Appendix D further describes the public involvement process.

ISSUES

This section describes issues regarding the refuge that were identified during public scoping.

HABITAT MANAGEMENT

Water rights and loss of water downstream due to refuge restoration projects are of concern.

- The public wants the Service to explain hydrology restoration, the purpose, and its impacts.
- Rumors of filling or draining Dahl Lake were questioned.

The CCP will describe the purposes for water management and its impacts.

Strong support and concern exists for the control or eradication of invasive plants.

- Individuals do not want the Service to change land management practices on the refuge so that the distribution of invasive plants increases.
- Concerns were expressed about native plant restoration and control or reduction of reed canarygrass. Reed canarygrass is present on the refuge, yet has been kept down by grazing.
- There were many disagreements about the most acceptable and efficient control methods.

The CCP will outline objectives and strategies for management of invasive plants, as well as for native grass restoration.

Grazing practices and intensity are generally issues.

- A local comment suggested grazing opportunities be continued, but in a compatible manner. Comments regarding the loss of a working ranch seem to center partially on the loss of possible grazing lands.

The CCP will review grazing as a land management tool.

WILDLIFE MANAGEMENT

The public advocates strongly for giving wildlife and their habitat foremost consideration.

- Wildlife-dependent uses must be given a high priority for consideration due to the requirement of the Improvement Act, yet the public had a concern for wildlife to come first.
- The refuge needs to be managed in accordance with the establishing purposes and provide for the conservation and enhancement of fish and wildlife.
- Some individuals suggested the refuge had the most biological potential for deer, elk, and upland birds rather than waterfowl, and could be an important wildlife habitat corridor.

- The refuge has a history of gray wolves occupying the area and conflicts with neighboring ranchers. As a national wildlife refuge, consideration must be given for wolf presence, yet it must be managed in response to depredation problems in compliance with the Endangered Species Act (ESA) and wolf recovery plan. It is also possible that grizzly bears use the area to some degree; bears would have to be managed for conservation of the species and to minimize conflict with humans.
- Questions were raised regarding the biological potential for reintroduction of species such as the trumpeter swan and Columbian sharp-tailed grouse.
- For a range of management activities, the public wanted to understand how the management techniques were decided and what effects could be expected. For example, how are population targets derived, why have or not have fences, and what impacts could be caused from water manipulation and hunting.

The CCP will contain management direction that addresses the establishing purposes for the refuge.

TRADITIONAL USE

The CSKT are concerned that refuge management activities not harm cultural sites.

- The tribes want a cultural resource survey conducted to define the extent of Native American use and identify sites. The refuge is part of the aboriginal homelands of the CSKT.
- The tribes voiced an interest in subsistence hunting on the refuge.
- The Service may accommodate Native American traditional use, while maintaining the integrity of the refuge.
- Public comments against Native American use generally stem from not understanding the legal requirements and criteria for administering these types of uses.

The CCP will explain traditional uses and provide for a quality public experience for all.

Social concerns for the loss of a working ranch surrounded the acquisition of the ranch.

Ranching is the cultural history of Pleasant Valley, and cattle grazing will be reviewed for opportunities as a land management tool.

PUBLIC USE

Public use was considered highly desirable, yet many wanted it managed in a way that did not degrade wildlife habitat.

- Many desire hunting as a recreational use and want access across the refuge for hunting opportunities on neighboring lands.
- A few commenters requested trapping access on the refuge, yet the majority of opinions were that trapping should not be allowed.
- Photography, nature trails, and fishing are popular requests, along with a few requesting horseback riding, snowmobiling, and cross-country skiing.
- Some individuals would like to see no recreational uses allowed.
- Some commenters were concerned about impacts to habitats that timber company crews have during access to the refuge.

The CCP will contain management direction for public use determined compatible with refuge purposes.

ADMINISTRATION

The public was concerned about facilities, refuge expansion outside of designated boundaries, and adequate refuge staffing.

- Facilities were of concern. Many buildings exist on the refuge. It needs to be determined which facilities to use for administrative purposes, along with where to place new structures (e.g., parking lots and signs) for minimal impact to wildlife.
- There were concerns about collaboration with the MPC on issues of access to refuge easements.
- There were concerns about whether the Service would be committed to the time and money required to maximize the potential for use of additional property.

The CCP will display the staff and funding required to effectively administer uses and manage for fish and wildlife.

3 Affected Environment

The Lost Trail National Wildlife Refuge lies in the west-central portion of Flathead County, Montana, approximately 25 air miles west of Kalispell (figure 1). To get to the refuge, visitors travel 20 miles on Highway 2, west to Marion, and northwest 20 miles through Haskell Pass.

The congressionally designated refuge boundary encompasses approximately 9,225 acres. Within the designated boundary, the Service manages approximately 7,885 acres (figure 4). Valley meadows and sloping uplands dominated by forest comprise the refuge. Located in an Intermountain drainage known locally as Pleasant Valley, the refuge has elevations ranging from 3,488 to 4,600 feet.

Tables 1 and 2 summarize the existing resources and conditions on the refuge, as well as the socioeconomic setting and administration. In-depth descriptions of the resources, conditions, and settings are found in this chapter. Further details can be found in appendix A.

GEOGRAPHIC SETTING

Lost Trail National Wildlife Refuge is nestled in the Pleasant Valley, which was formed during the last glacial period in North America. Pleasant Valley sits atop a vast, relatively uniform expanse of the Belt Rock formation called the Purcell Alticline.

Pleasant Valley is located in the Salish Mountains among medium-elevation mountains such as Ashley Mountain (6,300 feet) to the north and Murr Peak (6,763 feet) to the south, near the confluence of the boundaries of the Flathead, Kootenai, and Lolo National Forests (figure 5).

The Whitefish Mountains lie northeast of the refuge, beyond which Glacier National Park and the Continental Divide are found. The Purcell Mountains are directly west, and Little Bitterroot and Flathead lakes lie southeast of the refuge. Further east are the breathtaking Mission and Swan mountain ranges. The Cabinet and Bitterroot mountains are west of the refuge.

The refuge is part of the ecosystem designated by the Service as the Missouri, Yellowstone, Columbia River (MOYOCO) ecosystem (figure 6). The Columbia River watershed primarily falls into the Service's Region 1, a different administrative area. The Improvement Act and planning policy requires CCPs to show how refuge management contributes to the Service's ecosystem goals.

The mission for the MOYOCO ecosystem is to maintain, restore, and enhance riparian and watershed functions for the benefit of trust resources, Service properties, and the American public. This includes preservation and restoration of grasslands, riparian areas, and wetland habitats and conservation of endangered, threatened, and other species of special concern. The habitat and wildlife goals and objectives for the refuge contribute to the MOYOCO ecosystem mission.



Lindy Garner/USFWS

A healthy cluster of the threatened Spalding's catchfly grows on the refuge.

PHYSICAL RESOURCES

The soils, along with the water resources, provide the basis for the vegetation and conditions that create habitats for fish, wildlife, and plants.

SOILS

Pleasant Valley was formed during the Pleistocene Epoch by glacial contraction, and expansion and sedimentation activity after glacial melt at the end of the last ice age. The glaciers pushed south out of Canada to smooth and shape the underlying Precambrian Belt rocks, a sedimentary formation deposited more than a billion years ago. This bedrock is visible on the higher hills along the north edge of the refuge and in some road cuts along the main road through the refuge.

Glacial deposits sit atop the older Belt Rock formation, which faulted over younger Paleozoic rocks (Alt and Hyndman 1986). Receding glaciers often leave behind enclosed basins, some of which now contain lakes. The Thompson and McGregor lakes and other popular lakes south of the refuge are examples of these pothole lakes. Dahl Lake, in the eastern part of the refuge, is another example.

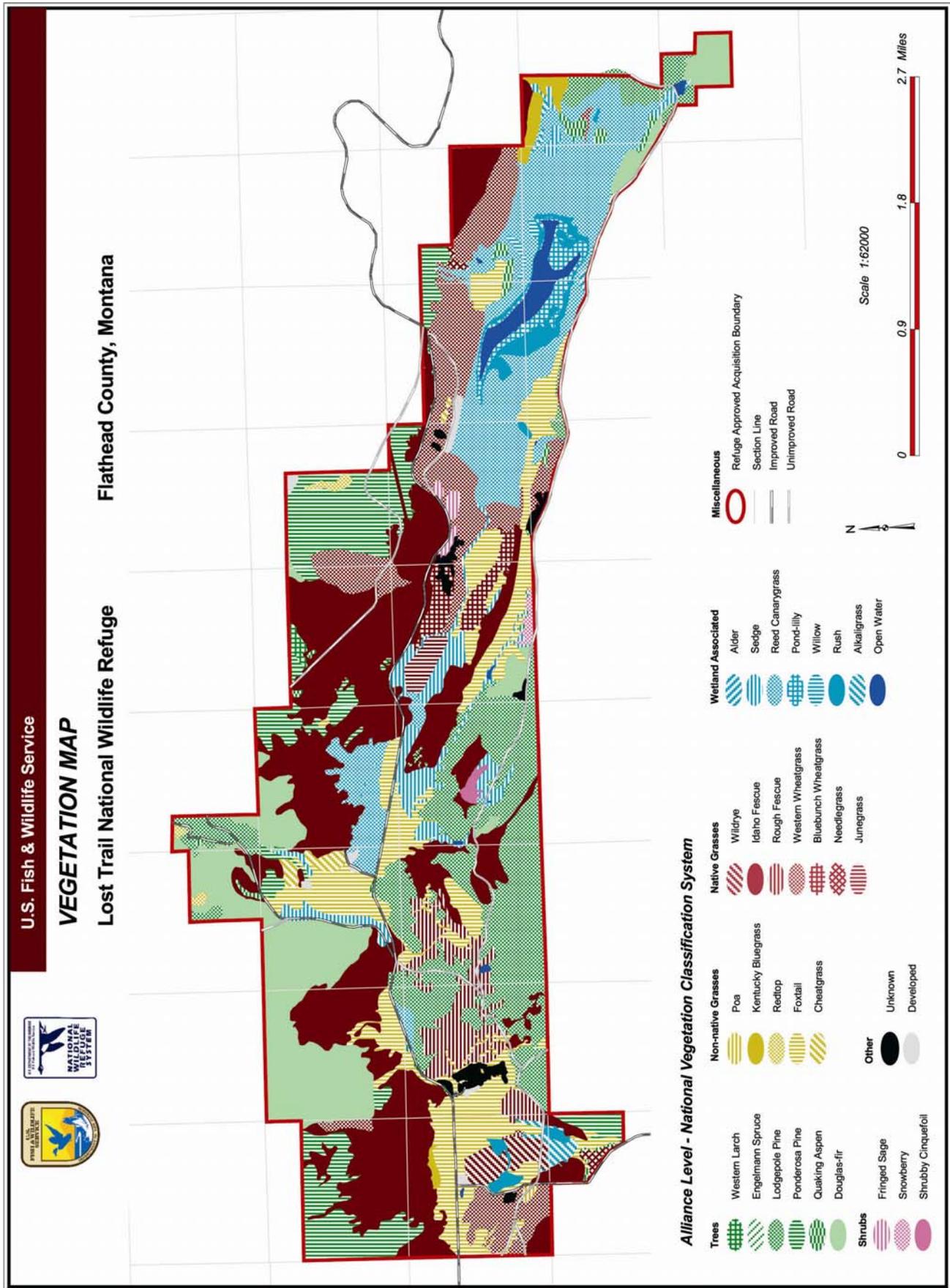


Figure 4. Vegetation of Lost Trail National Wildlife Refuge, Montana

Table 1. Summary of the natural resources of Lost Trail National Wildlife Refuge, Montana

<i>Physical Resources</i>	<i>Habitat</i>	<i>Wildlife</i>
<ul style="list-style-type: none"> — The refuge occurs in the glacially formed Pleasant Valley sheltered by the Salish Mountains. Soils contain significant amounts of silt and sand; organic soils occur around Dahl Lake and well-drained loamy soils are in the uplands. — Elbow Creek and several unnamed drainages fill the 216-acre Dahl Lake. Pleasant Valley Creek drains into the Fisher River watershed (part of the Columbia River headwaters). — The refuge is part of the MOYOCO ecosystem. 	<ul style="list-style-type: none"> — Ponding and channeling of creeks provided irrigation and flood prevention. Pond habitat provides waterfowl habitat and breeding sites for boreal toads. Warm water temperature and increased siltation are the result of decreased stream depth, straightening of the channel to aid irrigation, and reduced vegetation. Creeks no longer support a large native fishery. — Riparian shrublands important to migratory birds such as the willow flycatcher are in good condition along the north end of Pleasant Valley Creek. — The Dahl Lake wetland complex and isolated wetlands cover more than 1,000 acres. Wet meadows have mostly introduced meadow grasses dominated by reed canarygrass and Garrison creeping foxtail. Wetland vegetation provides habitat for many waterfowl and water birds. — More than 1,000 acres of native, bunchgrass prairie provides wildlife cover and nesting habitat. Palouse prairie is a rare ecosystem. — Lodgepole and ponderosa pine, and Douglas-fir are common forest species. These forests provide habitat for wildlife such as woodpeckers, owls, deer, elk, bears, and mountain lions. — Spotted knapweed is a nonnative, invasive plant that is fairly dispersed. This and other invasive plants such as tansy ragwort, foxtail, and reed canarygrass have reduced native species diversity. — Historic fire return intervals are around 125 years in the area north of the refuge. Fires have converted dense forest to open conditions, increasing wildlife browse and forage. — No areas meet all criteria of the Wilderness Act for designation as wilderness. 	<ul style="list-style-type: none"> — Common breeding waterfowl include mallard, lesser scaup, shoveler, and teal. Fall waterfowl populations are low. — Nesting water birds include red-necked and horned grebes, killdeer, black tern, and sandhill crane. — Neotropical migratory birds, including grassland species such as vesper, Savannah, and grasshopper sparrows, nest on the refuge. Many grassland species are experiencing population declines on a national level, likely due to habitat loss. — Populations of white-tailed and mule deer have been increasing steadily in the vicinity of the refuge. Approximately 300 elk winter on the refuge. Fencing poses a hazard to wildlife. The Rocky Mountain Elk Foundation (RMEF) has assisted refuge staff to remove more than 25 miles of fence remaining from ranching activities. Approximately 20 miles of unnecessary fence remain. — Small mammals include river otter, beaver, coyote, and wolverine. Ground squirrels are an important source of protein for predators, but can compete with other wildlife for forage and cause soil erosion. — Resident birds include black-capped chickadee, great horned owl, hairy woodpecker, nuthatches, and golden eagle. Upland game birds include spruce grouse and turkey. — All fish found in Pleasant Valley Creek on the refuge show stunting (yellow perch, northern pike minnow, and pumpkinseed), except redband shiners and suckers. It is likely Pleasant Valley Creek historically supported redband and westslope cutthroat trout. — Species of concern that reproduce on the refuge include bald eagle, black tern, boreal toad, and Spalding's catchfly. Species of concern that use the refuge occasionally include grizzly bear and gray wolf. Canada lynx and trumpeter swan are species of concern that occur in Pleasant Valley. The refuge is in an important grizzly corridor.

Table 2. Summary of the cultural resources, and socioeconomic, administrative, and partnership setting for Lost Trail National Wildlife Refuge, Montana

<i>Cultural Resources</i>	<i>Socioeconomic Setting</i>	<i>Administration</i>	<i>Partnerships</i>
<p>— Native people of the area were the Bitterroot Salish, Pend d'Oreille, and Kootenai, some of which are today members of the CSKT of the Flathead Indian Reservation.</p> <p>Teepee rings and other native occupation sites and use sites are documented.</p> <p>Native people hunted deer and elk, harvested huckleberries and camas bulbs, and traded furs with settlers.</p> <p>— Europeans settled in Pleasant Valley in the 1880s. The Jackson and Orr-Gardiner ranches are eligible for nomination to the National Register of Historic Places. The Doll Ranch has not been evaluated for eligibility.</p> <p>The Great Northern Railroad's main east-to-west line ran through Pleasant Valley from 1892 to 1904.</p>	<p>— The refuge is located in Flathead County—the fastest-growing county in Montana. The county population is 76,269 with 14.6 persons per square mile.</p> <p>Ranching and timber harvest are the main types of land use near the refuge.</p> <p>More than 3,250 businesses occur in the county, with 49,466 employees. Median household income is \$34,466.</p> <p>Nonresident travel numbers increased 7.6–63 percent at state entry points.</p> <p>— Existing roads provide access for wildlife observation, hunting, and other public use.</p> <p>— Some areas of the refuge have been open to deer, elk, mountain grouse, and turkey hunting since 2002. Waterfowl hunting is not allowed due to low numbers of ducks and geese on the refuge in the fall.</p> <p>— Fishing is not allowed due to the lack of viable fisheries and ongoing wetland restoration.</p> <p>— A public use handout and signs provide limited interpretive materials.</p> <p>— Environmental education includes some in-school presentations and on-site habitat improvements, monitoring, and surveys.</p>	<p>— There are more than 1,400 acres of state lease lands within the refuge boundary; these may be transferred to the Service when renewed.</p> <p>Habitat protection efforts include conservation easements purchased by the NRCS.</p> <p>Four land inholdings within the refuge will be evaluated for acquisition or protection when available.</p> <p>Land acquisition outside the refuge boundary is not needed. Habitat protection via conservation easements will be evaluated.</p> <p>— Many facilities are not needed for refuge management and occupy areas that could be restored.</p> <p>The headquarters complex was remodeled from part of the horse arena. Wells, septic systems, storage, shops, and horse barns provide the infrastructure.</p> <p>Culverts and cattle guards occur on 27 miles of roads.</p> <p>Nearly 30 miles of barbwire boundary and interior fence exists.</p> <p>— Lost Trail is a satellite refuge of the National Bison Range complex. The refuge has one full-time employee, the refuge manager. Seasonal employees and one to five volunteers provide assistance during the summer.</p>	<p>— Partnerships have been essential in carrying out refuge programs.</p> <p>— Partnerships have been established with Montana Fish, Wildlife and Parks (MFWP) for support with refuge establishment and planning.</p> <p>— Flathead and Lincoln counties, Plum Creek Timber Company (PCTC), U.S. Department of Agriculture (USDA) Forest Service, McGinnis Meadows Guest Ranch, and Montana's Department of Natural Resources and Conservation (DNRC) provide support including road and fence maintenance, invasive plant management, and fire protection.</p> <p>— A partnership with NRCS exists to manage the wetland restoration program.</p> <p>The RMEF has funded wildlife habitat improvement projects.</p> <p>— Pleasant Valley School, Montana Academy, Flathead Audubon, and Montana Conservation Corps (MCC) are partners in providing educational activities.</p>

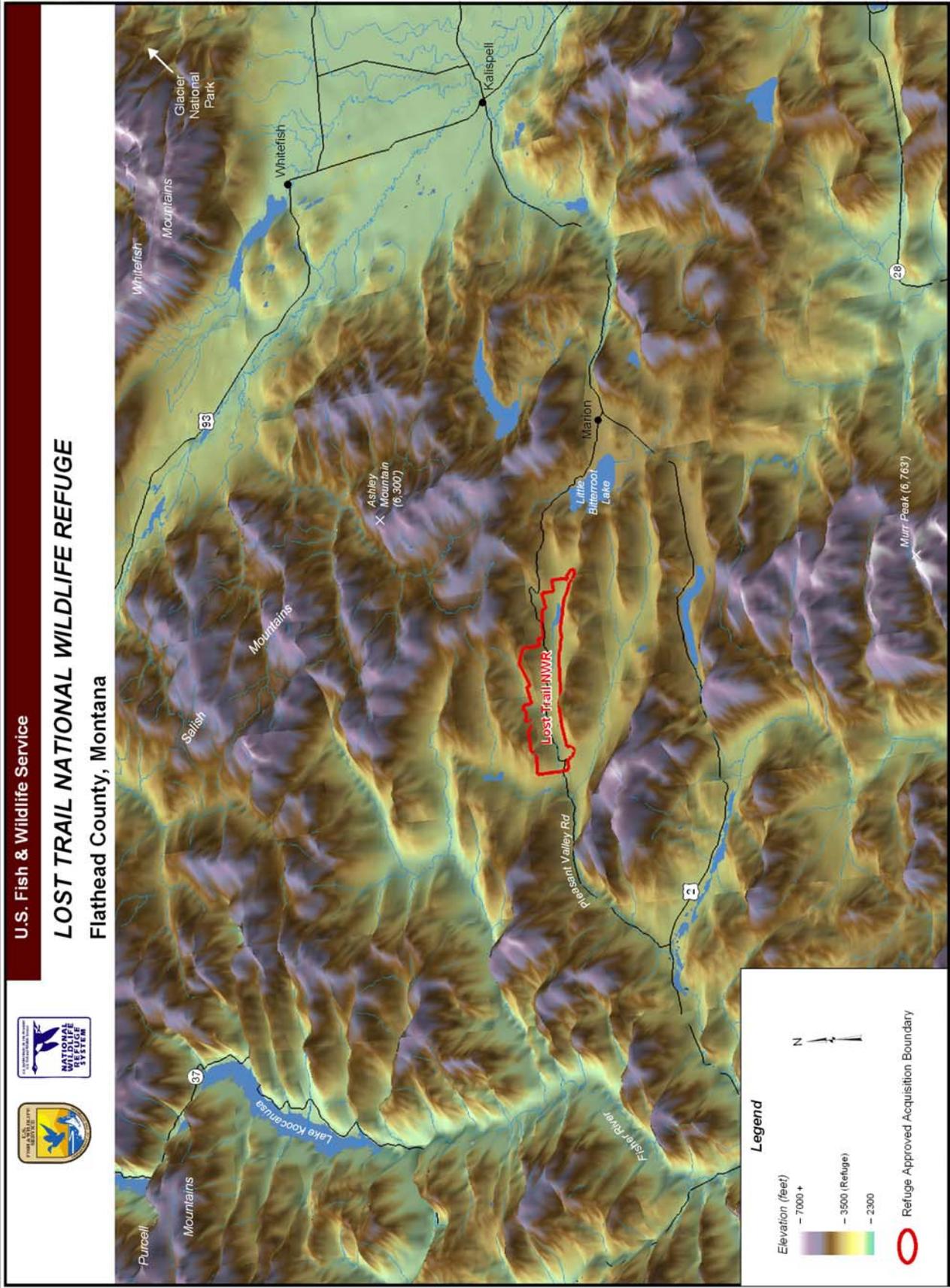


Figure 5. Geographic setting of Lost Trail National Wildlife Refuge, Montana

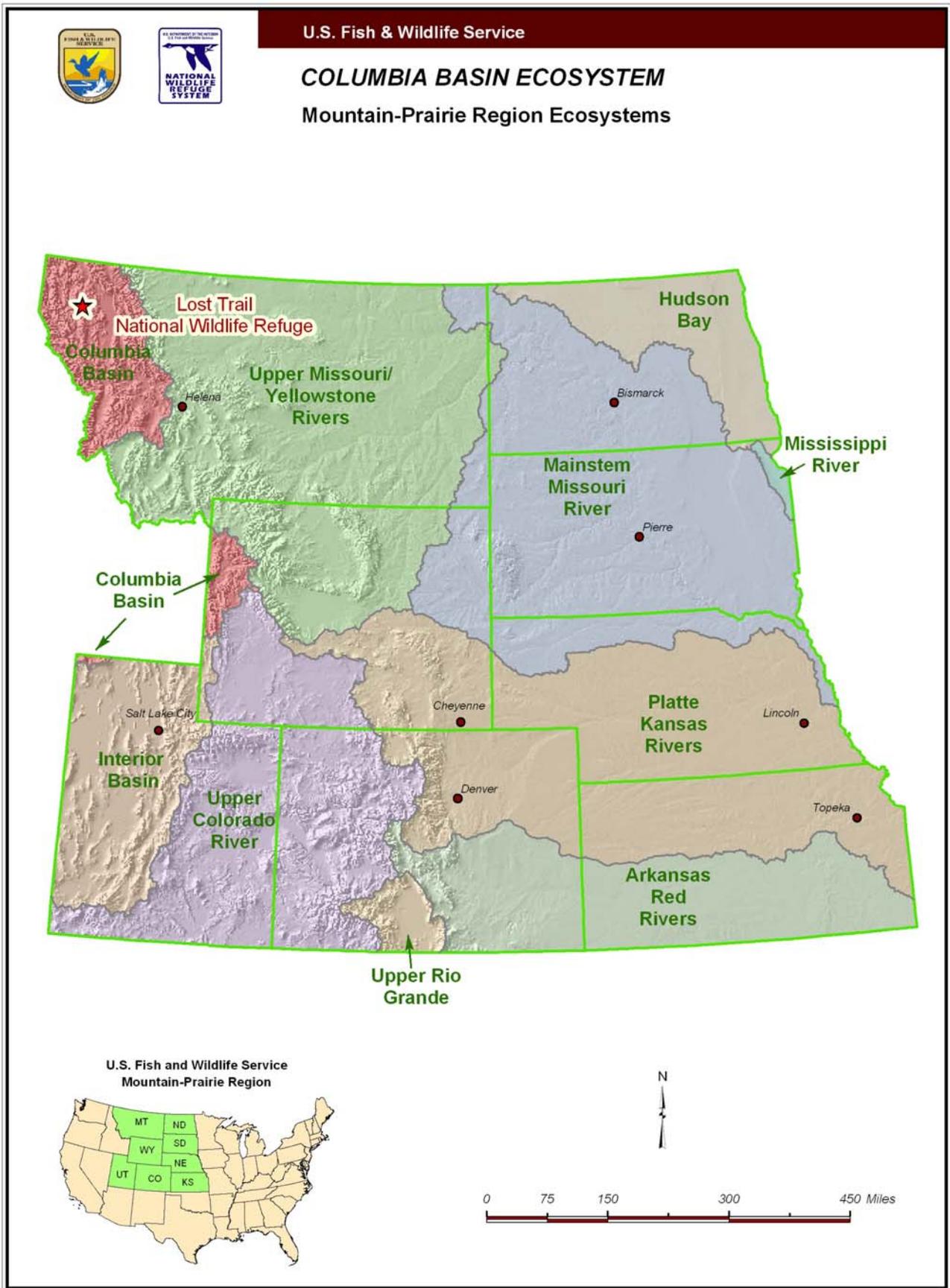


Figure 6. Columbia Basin ecosystem

Soils consist of loams—silt, sandy, gravelly, and clay loams. The soils formed in glacial deposits typically are loamy-textured with varying amounts and sizes of rock fragments. Most of these soils have a high component of volcanic ash in the surface layer. After the glaciers receded, a period of volcanic activity in the Northwestern United States deposited volcanic ash on much of the area. The eruption of Mount Mazama (now Crater Lake, Oregon) about 7,000 years ago is thought to have dropped up to 2 feet of volcanic ash in northwestern Montana. This pale brown ash is still visible in some forested areas under the forest litter.

Soil texture is determined by the relative amounts of sand, silt, and clay, along with rock fragments if present. When glaciers grind up Belt rocks, they create silt or very fine sand-sized particles. Volcanic ash is also mainly silt-sized particles. The soils in the refuge contain significant amounts of silt and very fine sand.

BOTTOMLAND SOILS

A glacial lake covered much of the Pleasant Valley at the end of the last ice age. Although most of the valley is now drained, the stream gradients are so low that water accumulates in the flood plain during spring runoff. Dahl Lake is a remnant of this old glacial lake.

Organic soils are found around Dahl Lake. The very poorly drained Barzee soils are adjacent to the lake and have stratified muck more than 50 inches thick. The McLangor soils are also very poorly drained mucky peat, but have stratified silt loam layers below 16 inches.

The flood plains are dominantly Meadowpeak silt loam, a deep, poorly drained soil. The profiles are silt loam and very fine sandy loam. Buried, brown ash layers can be found in these soils. Small areas of Blacklake mucky peat are found in slightly lower, wetter areas. These very poorly drained soils are similar to Meadowpeak, except they have 8–16 inches of mucky peat over the silt loam and very fine sandy loam textures. Along the edges of the flood plain on slightly higher areas are Whitebear–Dahlake silt loams. These somewhat poorly drained soils also have deep silt loam and very fine sandy loam textures, but they are sodium-affected with pH values as high as 10.0.

Some stream and lake terraces and small alluvial fans are adjacent to the flood plain. Perma and Dominic soils on the stream terraces formed in alluvium and have loamy surfaces, but are very gravelly loams to extremely gravelly loamy sands underneath. The Tally soils have deep sandy loam profiles. These soils are well-drained or somewhat excessively drained. The lake terrace soils formed in glaciolacustrine deposits and dominantly silt loam profiles. Some soils are sodium-affected and are somewhat poorly drained. The soils on alluvial fans

generally have deep silt loam profiles, but some have gravelly or very gravelly textures below about 2 feet. They are somewhat poorly drained or well drained.

UPLAND SOILS

The upland soils generally formed in deep, glacial deposits. Rock fragments are varying in size from small pebbles to stones. Rangeland areas are dominantly Prospect and Finleypoint soils. These soils are well drained and have dark-colored, loamy surfaces. Prospect soils have less than 35 percent rock fragments in the profile and Finleypoint soils have 35–60 percent. Forested areas are dominantly Courville and Winfall soils—loamy textures with 35–60 percent rock fragments. The Courville soils have a pale brown ash-influenced surface layer.

The Belt formation bedrock outcrops occur in some areas where glacial deposits have eroded away or were thin deposits. These bedrock areas are generally along the north part of the refuge at higher elevations. Soils formed in this bedrock are the shallow Rockhill and Sharrott soils, and the deeper Winkler soils. Some of these areas have remnants of deep, glacial deposits.

WATER RESOURCES

Pleasant Valley is crossed and irrigated by Pleasant Valley Creek. The refuge is located in a long, narrow east–west valley in which Pleasant Valley Creek flows south out of the Salish Mountains and moves westward (figure 7).

The creek is joined by the Meadow Creek ditch, which partially drains from the west end of Dahl Lake. The lake is filled by Elbow Creek and several unnamed drainages that end before the lake and seep into the wetland. Pleasant Valley Creek starts north of the refuge headquarters and flows south to the county road before heading west to drain into the Pleasant Valley–Fisher River, a tributary of the Fisher River.

The Fisher River watershed complex is part of the headwaters of the Columbia River. The Fisher River is a tributary of the Kootenai River and leads to Lake Pend Oreille, which is drained by the Columbia River. The Fisher River corridor is part of a large watershed conservation effort for native fish. The corridor was established by MFWP with an easement on PCTC land (figure 7).

In the eastern part of the refuge lies Dahl Lake, which is 216 surface acres at 3,511 msl contour. There are six intermittent creeks within the drainage area of the lake—all of these creeks end as they enter the valley floor, and none of them have channels that connect to the lake. An explanation for this may be that the valley floor is like a large porous sponge, from a deposit of glacial till, that pulls surface water to join the groundwater rather than form stream channels (Pierce 2001).

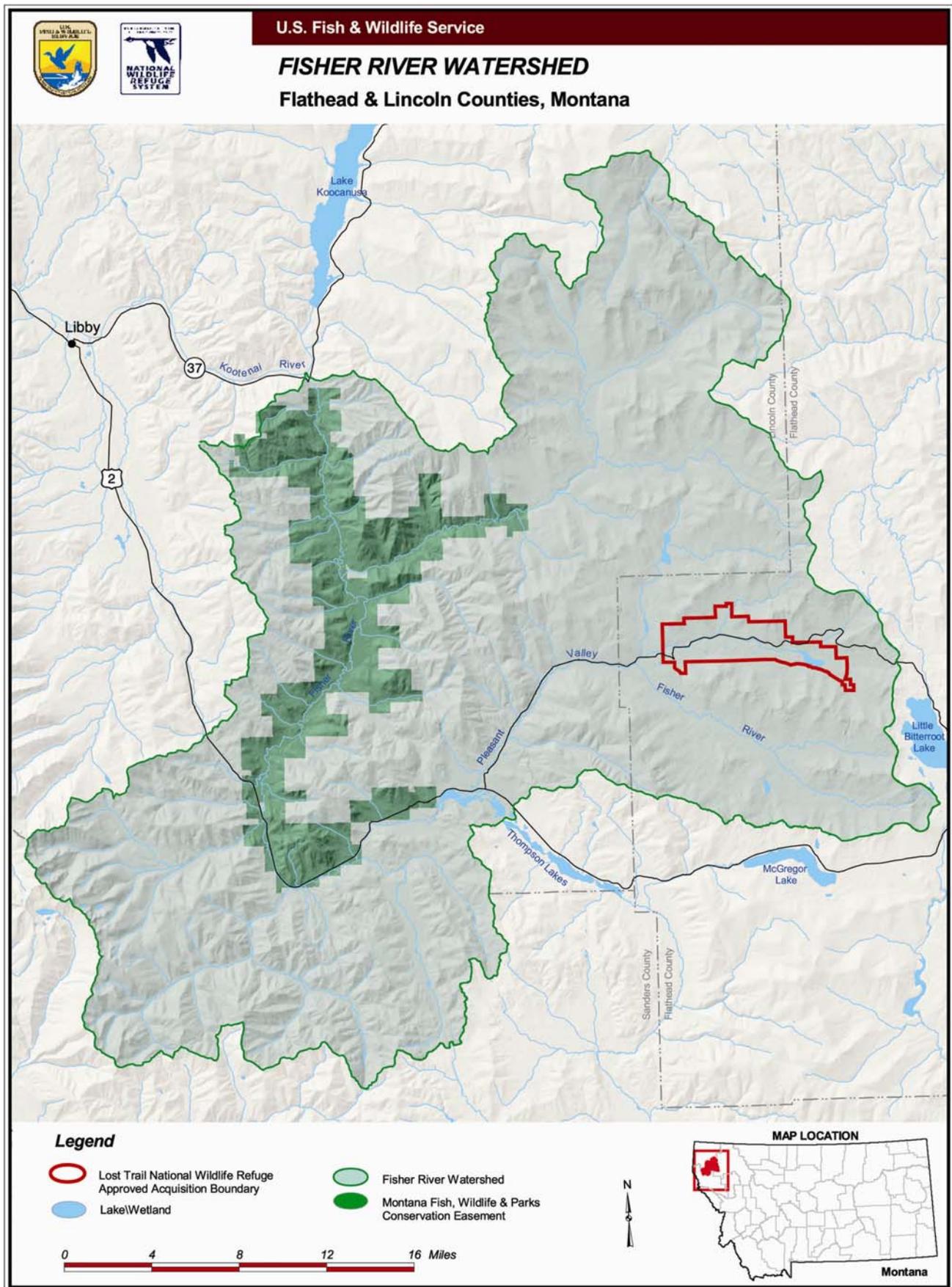


Figure 7. Fisher River watershed, Montana

Throughout the rest of the Pleasant Valley Creek drainage, eight other intermittent creeks exist—only two of their channels connect to the creek. This area was glaciated by the Cordilleran Ice Sheet, whose terminus was not too far south from Pleasant Valley.

HYDROLOGY OF PLEASANT VALLEY

The drainage area for Pleasant Valley Creek, as it leaves the refuge, is 53.6 square miles. For management reasons, this area has been delineated into three drainages (figure 8).

- Basin 1—53.6 square miles; terminates downstream at the western edge of the refuge
- Basin 2—31.1 square miles; at the current earthen check dam on Pleasant Valley Creek for Dahl Lake
- Basin 3—29.4 square miles; at an abandoned check structure on Pleasant Valley Creek

Within the drainage area of Dahl Lake are six intermittent creeks. All six of these creeks terminate on entry to the valley floor; none of them has channels that connect to the lake. Throughout the rest of the Pleasant Valley Creek drainage, there are eight other intermittent creeks; only two of their channels connect to the creek.

This area was glaciated by the Cordilleran Ice Sheet, whose terminus was not too far south from Lost Trail Valley. There appears to be widespread lake sediments formed by glacial damming of the valley. These sediments would restrict water infiltration and groundwater flow. One possible explanation for the terminus of the streams is that the hillslopes are comprised of permeable fan gravels, yet the valley floor is less permeable (Pierce 2001).

Dahl Lake does not appear as though it had a natural outlet channel. The linear shape of the outlet channel suggests that it was constructed. Historically, this channel and a dam allowed irrigators to back up water into the meadow around the lake and time the release best to manage their fields. The NRCS has an easement on the property where the outlet structure is located; the purpose of which is to restore the system to its natural hydrology.

Runoff predictions are based on average annual runoff numbers developed by the NRCS. Research for this area shows 7.2 inches of surface runoff for mountainous elevations of 4,000 feet and 10 inches for the elevation of 5,200 feet (Ralph Bergentine, NRCS, personal communication).

Table 3 shows the results of the runoff-mapping analysis. The basins were divided into elevation bands. The area in acres was multiplied by inches of rain, divided by 12, and totaled to predict runoff in acre-feet.

Table 3. Runoff predictions for Lost Trail National Wildlife Refuge, Montana

<i>Elevation (feet)</i>	Basin 1 West Drainage		Basin 2 Middle Drainage		Basin 3 Dahl Lake	
	<i>Runoff (inches/acre-ft)</i>		<i>Runoff (inches/acre-ft)</i>		<i>Runoff (inches/acre-ft)</i>	
4,000	7	5,085	7	511	7	5,426
4,000–4,400	8	2,465	8	132	8	3,641
4,400–4,800	9	1,203	9	26	9	2,217
4,800	10	273	10	0	10	920
Basin Totals	9,026		669		12,204	
Runoff Total = 21,899 acre-feet						

WATER RIGHTS

The refuge currently owns the necessary water rights to maintain existing wetlands in their present condition.

The earliest livestock water and irrigation claims for the refuge date back to 1890 and 1899, respectively. The amended irrigation claims describe 1,572 acres irrigated with 10,930 acre-feet per year.

The combined irrigation diversion rate at the western edge of the refuge is 20 cubic feet per second (cfs). This flow value does not include areas that are subirrigated by check structures with no flow rate claimed on the water right. It is important to note that the irrigated acreage figure does not include several natural wetlands. Filing on naturally subirrigated areas such as pasture and wetlands was not required under the statute establishing the adjudication.

The temporary preliminary decree for the Fisher River basin (76C) was issued in 1985. The basin was one of the first to be reviewed by the state through the water rights adjudication process. A complete list of water rights is in appendix A.

Some of the water rights were not accurately described in the preliminary decree. When the MPC negotiated transfer of the property to the Service, a water rights specialist was retained to review and amend the water rights. The validity of the water rights was documented, but some errors were found. Clerical errors were corrected, but the larger issues are still before the water court.

The largest irrigation claim is on Dahl Lake. Historically, the lake would back up and cause the small valley to flood, after which the water was released downstream in Pleasant Valley Creek. Although refuge stream flows and pond elevations have been monitored for several years to better understand available water, the effort has been hampered by extremely dry conditions.

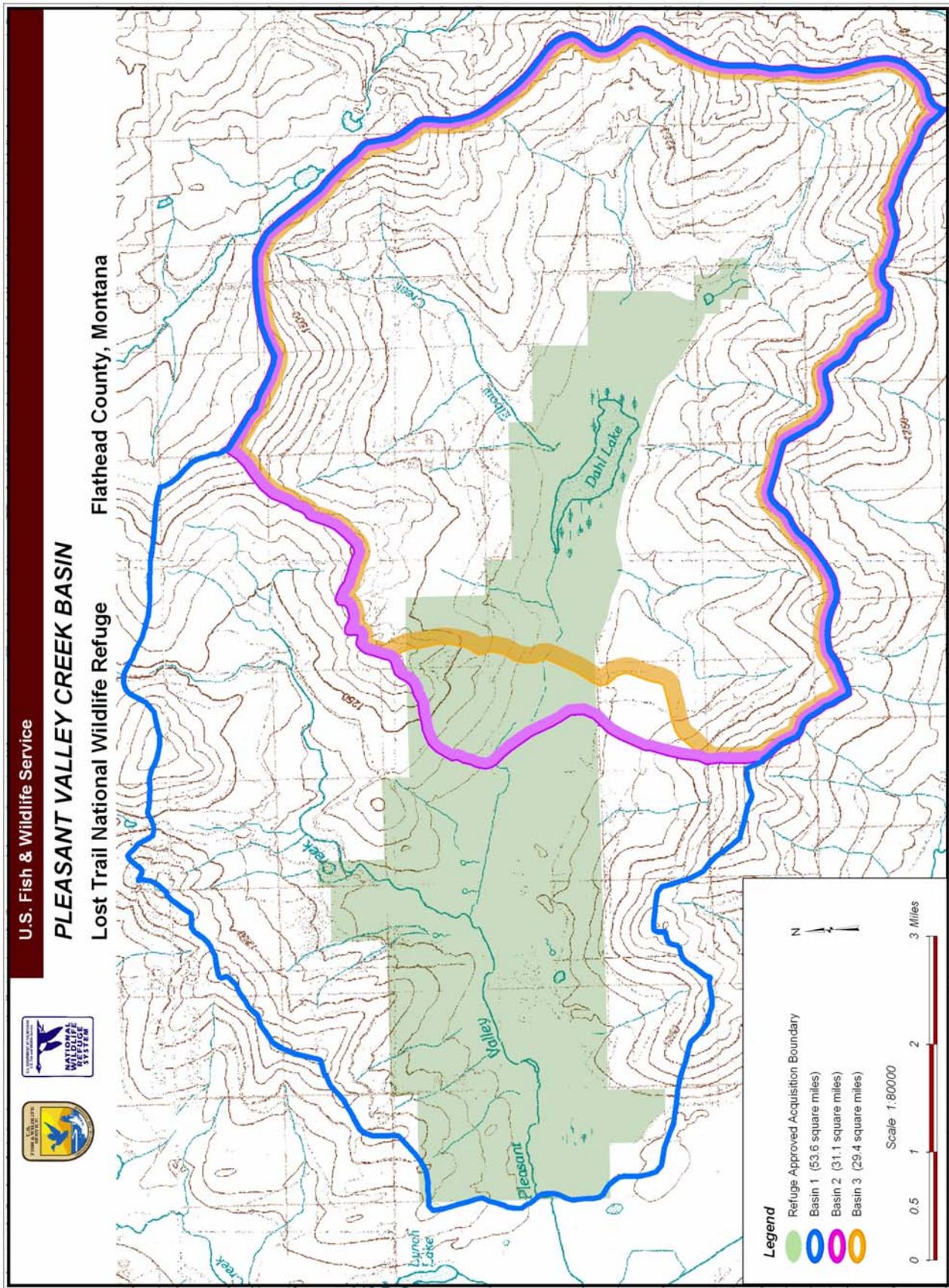


Figure 8. Pleasant Valley Creek basin, Montana

Recently the Montana State Legislature modified the statutes pertaining to adjudication—water users can present changes to the water court at any time and must no longer wait until the next decree stage. The MPC retained an attorney for this work at the refuge, which began this process in 1999. Money set aside in escrow is for the Service to defend water right changes that are currently before the Montana Water Court, if needed. This money will be available until the court process is complete and the judge issues a finding. If no legal costs are incurred, the money will be transferred to the seller, MPC.

John Westenberg of Land and Water Consulting, Inc. (Missoula, Montana) believes that the revised water rights currently reflect historic use of the water. The next step is to examine the reliability or availability of the water.

The water claims filed by the Lost Trail Ranch (before refuge establishment) received no objections from other users during the adjudication of the basin that occurred in the 1980s. This is an indication that the former ranch and general area experience few water conflicts.

CLIMATIC CONDITIONS

Precipitation is the most important criteria used to predict stream flow. At a nearby weather station called Pleasant Valley (southeast of the valley at 3,600 feet in elevation), the average annual precipitation for a 25-year period is 18.6 inches. A majority of the Lost Trail basin is 1,000 feet higher

in elevation than this weather station, resulting in greater rainfall, therefore another annual precipitation value was used. It came from a map of the entire state of Montana (made by Oregon State University and funded by the NRCS). This work more accurately predicts 22 inches, as established by the 1961–1990 data set. The Service is currently in the process of using several different predictive equations to estimate water supply.

Climatological data for 1931–1960 was supplied by the U.S. Department of Commerce, Environmental Data Service published in June 1968. This data set, while rather dated, summarizes the most comprehensive elements to climate that could be located. Table 4 displays this data, which is likely a compilation of sites; a nearby site might be more accurate, but none nearby collect evaporation or humidity.

AIR QUALITY

Air quality in the area of the refuge is considered good, with no nearby manufacturing sites or major air pollution sources.

Particulate matter (PM₁₀) is a measure of tiny liquid or solid particles in the air that is respirable in the lungs. In the area of the refuge, carbon from automobiles and diesel engines; soot from slash burning, forest fires, fireplaces, and wood stoves; and dust associated with wind-blown sand and dirt from roadways, fields, and construction sites may all contribute to particulate matter.

Table 4. Climatological data for 1931–1960 near Lost Trail National Wildlife Refuge, Montana

<i>Climatological Factor</i>	<i>Time Period</i>	<i>Measurement</i>
Precipitation	Wettest month (June)—mean total precipitation	2.34 inches
	Driest month (August)—mean total precipitation	0.97 inches
	Mean annual total precipitation	19.00 inches
	Mean annual total snowfall	85.00 inches
Temperature	January—normal daily maximum temperature	30.0° F
	January—normal daily minimum temperature	10.0° F
	July—normal daily maximum temperature	80.0° F
	July—normal daily minimum temperature	43.0° F
	Average annual temperature (at Glacier National Park, ~10,000 feet in elevation)	42.1° F
	Annual heating degree days	approximately 10,000 days
Humidity	Mean annual relative humidity	70 percent
Wind	Mean annual wind speed (prevailing winds from the west)	6 mph
	July—annual fastest wind speed (wind from the northwest)	72 mph
Evaporation	Mean annual class A pan evaporation	35 inches

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. Montana has adopted additional standards under the Montana ambient air quality standards.

Air quality problems in Montana are usually related to urban areas and mountainous topography or river valleys that are sensitive to temperature inversions. Particulate matter and carbon monoxide are the air pollutants that have the greatest adverse impact on Montana’s air quality.

The major sources of particulate matter are vehicles traveling on unpaved roads, sand and gravel from winter traction material, and residential wood burning. The major sources of carbon monoxide in Montana are motor vehicles and residential wood burning. The other criteria air pollutants under the NAAQS are lead, nitrogen dioxide, ozone, and sulfur dioxide.

The area around Kalispell was designated a nonattainment area and was not in compliance for PM₁₀ in 1989. A monitoring study indicated that material from road dust, gravel roads, parking lots, and construction activities in Kalispell were the main sources of the area’s particulate matter. Burning from wood stoves and open fires were secondary sources of PM₁₀. A technical committee developed control strategies that were applied to an area within 1 mile of the city limits. Attainment designation for the area will probably be achieved in the near future.

Between 1986 and 1995, national average concentrations of carbon monoxide decreased 37 percent and national emissions decreased 16 percent,

despite the fact that there was a 31 percent increase in total vehicle miles traveled in the United States.

BIOLOGICAL RESOURCES

This section describes the existing and potential plant and animal communities for the refuge.

HABITAT

Habitat types consist of subirrigated wet meadows, grassy uplands, and coniferous forests (figure 4).

The subirrigated wet meadows are composed primarily of introduced meadow grasses dominated by reed canarygrass and Garrison creeping foxtail, and basin wildrye, cattail, rush, and sedge. Table 5 lists and quantifies the vegetative resources.

Upland areas are composed of a mosaic of prairie grasslands consisting of the following:

- cool-season native grasses—rough fescue, Idaho fescue, bluebunch wheatgrass, Columbia and Richardson’s needlegrass, and needle and thread
- nonnative grasses—smooth brome, timothy, redtop, and Kentucky bluegrass
- invasive plants—spotted knapweed and tansy ragwort
- a diversity of native forbs

Coniferous forests are dominated by lodgepole and ponderosa pine, and Douglas-fir. Other forest species include subalpine fir, grand fir, Engelmann spruce, and juniper. Small pockets of quaking aspen, birch, and cottonwood are located throughout the refuge.

Table 5. Vegetative communities¹ of Lost Trail National Wildlife Refuge, Montana

<i>Riparian Area and Wetland (species / acres)</i>		<i>Native Grassland (species / acres)</i>		<i>Nonnative Grassland (species / acres)</i>		<i>Shrubland (species / acres)</i>		<i>Forest and Woodland (species / acres)</i>		<i>Nonvegetated Area (species / acres)</i>	
Reed canarygrass	973	Idaho fescue	2,146	Foxtail	1,007	Fringed sage	24	Lodgepole pine	1,212	Open water	107
Sedge	275	Western wheatgrass	758	Kentucky Bluegrass	62	Snowberry	17	Douglas-fir	926	Unknown	63
Rush	126	Rough fescue	279	Cheatgrass	36	Shrubby cinquefoil	16	Ponderosa pine	779	Structures	28
Pond-lily	83	Bluebunch wheatgrass	101	Redtop	23			Quaking aspen	76	Gravel pit	10
Alkaligrass	37	Wildrye	75	Poa	6			Western larch	14		
Willow	13	Needlegrass	20					Engelmann spruce	6		
Alder	6	Junegrass	43								
Total	1,721	Total	3,422	Total	1,134	Total	57	Total	3,013	Total	101

Total Refuge Acres = 9,225^{2,3}

¹Derived from the National Vegetation Classification System, alliance level

²The refuge acreage includes state land leases.

³Total acreage figures add up to 9,347 because of how open water and lake acreages are used, and depending on climatic conditions.

RIPARIAN HABITAT

Much of the riparian habitat in the Western United States has been lost or degraded due to flood control, irrigation projects (Hendrickson and Kubly 1984), grazing (Bock 1993), logging, and housing development.

Riparian shrubs—alder and willow—occur along Pleasant Valley Creek (USFWS 1982). Meadow Creek is a constructed ditch that flows out of the west end of Dahl Lake, across an open meadow, and into Pleasant Valley Creek at the horse ranch. From there, the stream flows through cottonwoods, willows, and a water control structure at refuge headquarters, before leaving the refuge. Deciduous, riparian woodlands of aspen and cottonwood occur in small patches (USFWS 1982).

Fish Habitat

The past uses of the refuge, as well as of surrounding lands on the valley floor, have been primarily for raising beef cattle. Subsequently, the creeks and lakes have been modified to provide for irrigation of grass and hayfields and no longer support a large native fishery. Historically, the streams in this area had a meandering pattern, profile, and dimensions prior to irrigation, flood prevention, and hayfield needs.

Pleasant Valley Creek is a tributary of the Fisher River (figure 7), which is an important focus area for native fish restoration for MFWP. Pleasant Valley Creek currently contributes to the system as a non-fish-bearing tributary.

Pleasant Valley Creek could possibly function as a native-fish-bearing tributary after restoration efforts. Historically, it supported Columbia redband and westslope cutthroat trout. Pleasant Valley Creek drains into the Fisher River where bull trout (federally listed as threatened) are being restored.

Water temperature is a critical component of habitat selection for these native, cold-water trout species. Ponding and channeling have decreased the stream depth, and large sections of stream bank are denuded of native vegetation, all of which lead to increased water temperature and siltation. Pleasant Valley Creek's control structures also limit fish movement.

Current water temperature is too high and there has been too much siltation to support redband trout. Loss of habitat is the main problem for the westslope cutthroat trout, due to loss of stream water to irrigation and barriers created by dams and road culverts (Gardner 2001).

Riparian Shrublands

Riparian shrublands consist of tall shrubs such as alder, willow, birch, and dogwood. This habitat is

important foraging and nesting habitat for a diverse set of migratory birds, including many priority species [as designated by Montana Partners In Flight (MPIF)] such as the willow flycatcher, gray catbird, warbling vireo, MacGillivray's warbler, and lazuli bunting. As the Montana Bird Conservation Plan points out, this habitat is also used by common species such as song sparrows, which should respond quickly to restoration efforts, in line with the concept of "keeping common birds common" (Casey 2000).

The north end of Pleasant Valley Creek has been mostly undisturbed for approximately 10 years and is in relatively good condition. Prior to that, some selective logging occurred. Preliminary bird surveys suggest use by passerines such as song sparrows, and ruby-crowned and golden-crowned kinglets.

The willow flycatcher is a priority 2 species for riparian shrub habitat (designated by MPIF), and occurs in the Pleasant Valley Creek corridor. These birds breed in riparian habitat with a midstory of 6- to 7-foot alders or willows interspersed with openings (Casey 2000).

Conservation

Plans are in draft form to improve the stream channel of Pleasant Valley Creek to create or enhance fish habitat by restoring sinuosity on the south end where it was channelized and straightened. The NRCS is in the process of formalizing restoration plans for Pleasant Valley Creek (figure 3).

The plan calls for restoration of stream sinuosity and streambank vegetation. Lower Moose Pond is an artificial impoundment that was developed when the refuge was a working cattle ranch. This pond provides waterfowl habitat and is one of the two largest reproductive sites for boreal toads in the Rocky Mountains.

WETLAND HABITAT

Wetland habitat consists of the Dahl Lake wetland complex along with isolated wetlands that are seasonal, temporary, permanent, and semipermanent (figure 3). The wetland habitat on the refuge has tremendous biological potential.

The refuge has four permanently flooded wetlands or ponds:

- southeast pond surrounded by alders and lodgepole pine; species recorded include moose and olive-sided flycatcher
- wetland south of Pleasant Valley Road near the South 1019 intersection; species recorded include deer, elk, marten, Canada goose, mallard, wigeon, and common goldeneye
- upper wooded pond on Pleasant Valley Creek, excavated and diked, surrounded by tamarack, poplar, birch, aspen, and Douglas-fir; species

recorded include bufflehead, horned grebe, and hooded merganser

- lower pond on Pleasant Valley Creek, excavated and diked, surrounded by alders and grasses; species recorded include boreal toad, long-toed salamander, deer, elk, marten, Canada goose, mallard, wigeon, and common goldeneye



Dave Menke/USFWS

Wetlands are habitat for many species of waterfowl including the northern shoveler.

There is an unknown amount of fens on the refuge. Fens are wetlands dominated by emergent sedge vegetation. They occur in northern regions that have an underlying layer of peat covered with many species of mosses and aquatic macrophytes. A fen is similar to a bog, but is alkaline rather than acidic, with a much higher nutrient content. Fens gain nutrients found in precipitation, surface water, and groundwater, whereas bogs are fed by nutrients in precipitation only (Aerts 1999). Wet meadows are like fens, but are much more numerous across the country.

Most species use different types of wetlands to meet their life history requirements. For example, American bitterns nest in shallow water (less than 4 inches deep) with dense, robust emergent vegetation, while trumpeter swans will nest in water greater than 20 inches deep. Both black terns and trumpeter swans need abundant, floating, dead vegetation.

Species of concern (as designated by MPIF) that have been documented using refuge wetlands include the bald eagle (threatened) and several category 2 species (horned grebe, hooded merganser, black tern, and willow flycatcher).

Wetlands with diverse emergent vegetation, seed-producing annuals interspersed, and open water with submergent vegetation provide the habitat requirements of many waterfowl and water birds (Cowardin et al. 1979). Emergent vegetation such as cattail, rush, and bulrush is critical to successfully raising a brood, with a variety of uses from foraging habitat to escape cover. Submergent vegetation (e.g., pondweed, mint, and horsetail) provides seeds

and the substrate necessary for invertebrate populations that are food for waterfowl.

Dahl Lake Complex

Dahl Lake is a natural lake that spills over to the west into the surrounding wetland complex in high-water years. This complex naturally fluctuated in water level seasonally and yearly, creating an array of temporary, seasonal, and semipermanent wetlands.

Around 1940, the natural spillway for Dahl Lake was channelized and directed through a ditch system named Meadow Creek. These actions, which reduced the lake's water level and dried up surrounding wet meadows, were done to increase hay pasture. The resulting reduction of surface water and loss of wetland vegetation has made these areas less conducive to use by waterfowl and other water birds.

Meadow Creek extends westward through the valley from the western end of Dahl Lake. Portions of the creek were more recently dredged to increase water flow efficiency for irrigation. Historical and current aerial photos show the area as a complex of temporary and seasonal wetlands, with seepage and overflow out the west end of the complex.

The National Wetland Inventory (NWI) data (1982) for the Dahl Lake complex identified the following wetland types:

- 182 acres (different than table acreage) of open water;
- 80 acres of semipermanent wetlands (water through spring and summer and frequently into fall and winter);
- 432 acres of seasonal wetlands (water in spring and early summer, but generally dry by late summer and early fall); and
- 376 acres of temporary wetlands (water for only a few weeks after snowmelt and few days after heavy rainstorms).

Dahl Lake has submergent vegetation such as mint and pondweed. It is used by black terns (candidate species, category 2), soras, waterfowl, and sandhill cranes. Lower Moose Pond and Dahl Lake host the largest populations of boreal toads in the Rocky Mountains.

Semipermanently flooded wetlands include areas surrounded by hardstem bulrush. Intermittently flooded wetlands include a few wet patches of alkaligrass mixed with bluegrass. Saturated wetlands cover 15 acres (USFWS 1982) of wet sedge areas.

Seasonally flooded wetlands consist of reed canarygrass with small, intermingled sedge patches. Historically, these areas probably included mainly

sedge, rush, cattail, and bulrush vegetation. Isolated seasonal wetlands are surrounded by bulrush. Seasonal wetlands provide abundant invertebrate foods and nesting cover for species that nest over water.

Temporarily flooded wetlands consist of subirrigated pastures with Garrison creeping foxtail. Alder and willow historically occurred along the ditches. Birds breeding in these wetlands include savannah sparrow, sandhill crane, and common snipe. Temporary wetlands are important for breeding waterfowl, especially early nesters such as mallards and teal, because they provide isolation and spacing and because their shallow waters warm rapidly to provide the first invertebrate foods in spring (Swanson et al. 1974, Baldassarre and Bolen 1994).

Conservation

Many of the refuge's wetlands have potential for restoration to basins that discharge and recharge on a seasonal basis, with either naturally occurring runoff or water control structures. A restored Dahl Lake complex would have the potential to provide habitat for trumpeter swans (candidate species, category 1).

The NRCS bought a permanent easement on 1,770 acres of refuge wetland (figure 3) for the WRP. The emphasis of the WRP is to protect, restore, and enhance the functions and values of wetland ecosystems to attain:

- first and foremost, habitat for migratory birds and wetland-dependent wildlife, including threatened and endangered species;
- protection and improvement of water quality;
- reduction of water flows due to flooding;
- recharge of groundwater;
- protection and enhancement of open space and aesthetic quality;
- protection of native plants and animals;
- contribution to education and scientific scholarship.

The WRP helps eligible landowners protect and restore the original hydrology, native vegetation, natural topography, and values of wetlands in the agricultural landscape. The national WRP goal is “no net loss of wetlands” (USDA NRCS 2000).

GRASSLAND HABITAT

A diverse set of grasses cover the majority of the refuge. The main grass types include tall and medium-tall bunchgrasses, and some planted areas of medium-tall sod. Basin wildrye occurs in the bottomlands of more moist sites (75 acres). More than 2,400 acres of uplands have fescue species

intermixed, in some low areas, with 882 acres of wheatgrass and redtop-dominated areas. Planted areas of foxtail and Kentucky bluegrass cover more than 1,000 acres. The area south of the county road (includes the WRP easement) has a wide diversity of sedges, native grasses, and forest.

There are more than 1,000 acres of relict, native, bunchgrass prairie that provides wildlife cover and nesting habitat. Idaho fescue and western wheatgrass have very good to excellent palatability and are good in energy value as forage for deer and elk (Mueggler and Stewart 1980). These grasses also provide fair to good cover for nongame birds (Dittberner and Olson 1983, Tirmenstein 1999). Upland grasslands and one unit of bottomland grasslands (figure 2; mitigation units 11–14, 19) surround the Dahl Lake wetland complex, and have many areas important for waterfowl.

Prior to establishment, the refuge was a working cattle ranch. Some areas have been overgrazed, leading to weedy areas and sparse vegetation with low productivity. The impact of defoliation on plant vigor is depression of herbage and flower stalk production. Adequate plant vigor and productivity are essential to regain the climax grassland community, with native plants occurring in their natural, “correct” percent compositions.

Conservation

For vigor to recover in grassland species such as Idaho fescue, areas of extremely poor vigor may need 6–7 years of rest, while bluebunch wheatgrass can take up to 10 years (Mueggler 1975). In areas of intermediate vigor, Idaho fescue may be able to recover after 3 years of protection (Mueggler 1975). Once vegetation targets are met, some disturbance is required to maintain vigor unless native herbivores are concentrating in these areas.

Conservation is essential for Palouse prairie, which is listed as a rare ecosystem exhibiting a 98 percent decline (Noss et al. 1995). Native bunchgrass prairie is an important habitat coverage that is limited in the Northwestern United States. These upland grasslands overlay rolling topography that grades into forest habitat and encompass approximately 1,500 acres. Most of these upland grassland areas are comprised of native grasses (figure 4).

Birds key into vegetation structure and litter for nest site selection rather than plant species composition (Cody 1968, Wiens 1969, Kantrud and Higgins 1992). Tame grasses can provide suitable habitat for ground-nesting birds; however, it is important to maintain and restore native plant communities, where feasible, to meet Refuge System goals and further initiatives such as “bring back the natives.”

FOREST HABITAT

Forest habitat is composed of coniferous and deciduous forest occupying approximately 3,000 acres of the surrounding slopes of the valley. Dominant tree species include lodgepole pine, Douglas-fir, ponderosa pine, and quaking aspen. Other species found include western larch, Engelmann spruce, subalpine fir, grand fir, spruce, juniper, black cottonwood, and white birch (figure 4).

Stands of large ponderosa pine historically dominated most dry forest sites in western Montana. These dry forests are also composed of a mix of ponderosa pine and Douglas-fir. Logging and fire suppression have resulted in an alteration of tree age-class structure, physical structure, density, and species composition (Barrett 1979, Schubert 1974, Shepperd et al. 1983). Large, old-growth trees in open settings have been replaced with dense stands of younger trees.

Although forest habitat types have been initially classified (figure 4), a more thorough evaluation is needed to determine the amount of open areas, and provide species-specific coverage types. Initial efforts grouped the largest area possible for dominant tree species; other available habitat types may be inclusions within large forest areas.

Aspen groves are important components of the diverse habitats on the refuge. These areas provide food and nesting habitat for a variety of wildlife. Aspens are important for stabilizing soil and watersheds. Healthy stands of trees, with shrub and herbaceous understories and tree litter, provide nearly 100 percent vegetative cover. Soil cover and the intermixture of herbaceous and woody roots protect soil, except during very intense rains (DeByle 1985a).

Associated Wildlife

Many priority bird species are closely associated with old forest stages and snags, such as the Lewis's woodpecker, pileated woodpecker, olive-sided flycatcher, flammulated owl, white-breasted nuthatch, and Williamson's sapsucker, all of which have been documented on the refuge. Regional populations have decreased due to the reduction of old forest stages.

Olive-sided flycatchers, flammulated owls, and black-backed woodpeckers (priority 1 species for the MPIF program) are found, respectively, in open-canopy woodlands, open-canopy ponderosa pine, and closed-canopy lodgepole pine.

Golden eagles are nesting in Douglas-fir on the refuge. Yellow-billed cuckoos are a federal candidate species that could be using the cottonwood-aspen woodland associations.



Dave Menke/USFWS

Lewis's Woodpecker

While the refuge does not have enough forest habitat to provide all life requirements for the grizzly bear, gray wolf, and Canada lynx, with the large, surrounding, land tracts owned by the USDA Forest Service and PCTC, refuge lands could provide an important linkage area for these species. Grizzly bears and gray wolves are known to occur in the surrounding forested area, and Canada lynx could potentially be using the refuge as a corridor or foraging area.

The refuge harbors large wintering deer and elk populations. They use the dry forest areas of ponderosa pine and Douglas-fir. Elk live in high elevations in semi-open forests and mountain meadows during the summer. In the winter, elk migrate to lower sheltered valleys, windswept meadows and lower wooded slopes. Tree lichen is an important forage for deer and elk during winter (Baty et al. 1996), with their typical diet consisting of mainly grasses, sedges, and forbs.

Wild Merriam's turkeys were transplanted to Pleasant Valley in 1999. Although, turkeys are not indigenous to Montana and are not a priority species for management, they are a popular game species and are considered for habitat management to better serve the public. Turkey hunting is open in fall and spring on the refuge, except in the bottomlands between south of the county road and north of South Pleasant Valley Road.

Merriam's turkeys are associated with the edges of ponderosa pine, lodgepole pine, and Douglas-fir forests, where there are open areas for foraging and mating (MacDonald and Jantzen 1967). Turkeys use forested areas as cover from predators and for tree-roosting at night. Open areas provide a greater abundance of insects for young poults and females. This varied habitat of both open and covered areas is essential for wild turkey survival. Most turkey sightings have occurred in the refuge's mixed-conifer and hardwood areas and meadows surrounding the Dahl Lake complex.

A bald eagle has nested in the aspens on the north side of Dahl Lake for several years. Many migratory songbirds and woodpeckers use aspen for foraging and nesting habitat, especially moist aspen sites where bird species diversity tends to be higher than stands on dry sites (DeByle 1985b). Ruffed grouse use aspen communities extensively for an abundant and nutritious food source, as well as for courting, breeding, and nesting (DeByle 1985b).

Young aspen provide browse for deer and elk, especially valuable during fall and winter when protein levels are high relative to other browse species (Tew 1970). Aspen also provide thermal cover for deer and elk, which is important for summer shade and winter warmth. Moose use aspen in summer and winter (DeByle 1985b).

INVASIVE PLANTS

Invasive plants have undergone extensive range expansion. They often create dense stands that turn native plant communities into weed wastelands. The presence of invasive plants can alter the functioning of ecosystems by loss of wildlife habitat, displacement of native species, change in carrying capacity from reduced forage production, lower plant diversity, and increased soil erosion and sedimentation.

The refuge has not yet been inundated with a large number of invasive plant species. Spotted knapweed and tansy ragwort are the two most common and noticeable invasive plants. Kentucky bluegrass has invaded some areas of the refuge. Sulfur cinquefoil exists on the refuge, intermingled with the native cinquefoil, and the extent of this problem has yet to be defined. Foxtail species and reed canarygrass are other invasive plants that are impacting native species diversity and wildlife habitats.

Control of invasive plants is costly in time and money, and requires careful planning, implementation, and monitoring as defined by a plan to be successful. Native plant restoration is planned for the WRP easement, and will be conducted through the partnership with the NRCS.

Spotted Knapweed

Spotted knapweed is fairly dispersed over the refuge and is likely to become dominant without control efforts. Spotted knapweed aggressively invades grassland and early successional forest sites (Rice et al. 1997a). As spotted knapweed increases on a site, other species decline and there may be up to a 60–90 percent decrease in graminoid production (Harris and Cranston 1979, Bucher 1984, Morris and Bedunah 1984).

Tansy Ragwort

Tansy ragwort is a new, encroaching plant that occurs in many isolated pockets on the refuge; eradication may be possible if heavy effort is put into its control early.

The refuge participates in a working group that coordinates control of tansy ragwort within the area. In 2000 and 2001, ragwort locations were mapped and treated with hand pulling and herbicide. Chemical and biological controls are the two most common methods used for these invasive plants. Evaluation of biological control agents is essential prior to release to ensure they do not alter or disrupt the native insect community, especially pollinators.

Foxtail

More than 1,000 acres of foxtail occur on the refuge. Foxtail plants are palatable, but are a poor nutrition forage grass for deer and elk. Foxtail can provide some nesting cover for waterfowl (Hitchcock 1971). Foxtail species are often seeded along with timothy; the result is reduced plant diversity from vigorous spreading and domination of the area occupied.

For effective control, elimination methods are used with simultaneous introduction of a desirable competitor (Weaver et al. 1990).

Reed Canarygrass

Dahl Lake water levels have been stabilized at a lower level for multiple years to promote drying of the upper portions of the meadow for hay pasture. A consequence of these stabilized water levels is increased cattail and reed canarygrass, which has likely reduced the area's attractiveness to waterfowl (Smith and Kadlec 1986). In the past, cattle grazing kept the reed canarygrass in check to some degree.

Reed canarygrass has taken over the majority of the Dahl Lake complex at 780 acres (most occurs in units 14 and 19; figure 2). In unit 14, the largest section of canarygrass is still interspersed with native sedges and, therefore, has a greater chance for restoration to native species. Control efforts are needed to stop the canarygrass from taking over the entire wetland complex.

Although some waterfowl species use reed canarygrass as nesting substrate, it is not a native plant species. Reed canarygrass often grows into a monoculture, reducing species diversity. A return to native plant diversity would include species such as cattail and bulrush, along with a variety of wetland plants such as sedge, mint, and pondweed. These native plants would increase food resources and nesting substrates for a greater diversity of wildlife.

FIRE REGIME

Limited historical fire regime information is available. Wildland fires range from smoldering duff to stand-replacing crown fires. Fire ignitions are classified as natural or human caused. Lightning is a natural, random weather event. Human-caused fire is accidental, negligent, or deliberate arson. An ignition from either source developing into a spreading wildland fire is dependent on many

variables, primarily weather, topography, and available forest fuels.

Fire has a demonstrable effect on wildlife habitat through its effects on food plants. The combination of opening up stands by killing overstory trees, reducing competition by removing understories, and rejuvenating sprouting plants through the top-kill can significantly increase the availability of palatable browse and forage.

Information presented here was obtained from the USDA Forest Service, Canoe Gulch Ranger Station in Libby, Montana. The Pleasant Valley area has been designated a “fire group six habitat” by the USDA Forest Service:

- Douglas-fir is both the indicated climax species and a vigorous member of seral communities usually occurring at elevations of 3,000–6,500 feet. It is not uncommon for Douglas-fir to dominate all stages of succession.
- Ponderosa pine, western larch, and lodgepole pine are components within this habitat group.
- Whitebark pine can be found at the upper elevation sites.
- Subalpine fir and spruce are essentially absent, although there is a tiny bit of Engelmann spruce on the south side of the refuge.
- Various shrubs and moist site forbs such as kinnikinnick dominate the undergrowth, along with pinegrass and elk shrub.

Fire history studies conducted in southwestern Montana (sites similar to forest immediately north of the refuge) indicate fire was an important agent in controlling density and species composition. Low- to moderate-severity fires converted dense stands of pole-sized or larger trees to more open conditions. Subsequent light burning maintained stands in a parklike state. Frequent low- to moderate-severity fires favored larch and ponderosa pine over Douglas-fir in stands where these species occurred. Severe fires probably occurred on dense, fuel-heavy sites and resulted in stand replacement that favored lodgepole pine.

Fire’s role as a seedbed-preparing agent for Douglas-fir shows this species establishing itself on a variety of seedbeds and that it is not dependent on mineral soil conditions for successful regeneration. Fire’s role as a stand-replacement agent is more pronounced when the natural, fire-free interval is increased.

Fire occurrence and intensity is dependent on the area’s wet and drier habitat types. Fire occurrence is indicated within the Grubb Mountain area (immediately north of the refuge) by the recorded fire suppression actions—12 lightning-caused and 0 human-caused fires since 1908 when records were initiated. Human activity such as piling slash from

timber harvest, piling poles from thinning, and filter strip rows from road construction contribute to and influence fire behavior. Naturally occurring, dead, forest fuels occur from insect disease, snow breakages, and windthrow throughout the drainage. The highest hazard fuel loading occurs in remaining thickets of lodgepole pine that sustained mortality from mountain pine beetles.

There is little, if any, evidence of pine beetle mortality within forested areas on the refuge. There is widespread, hazardous fuel loading in the mixed conifer, Douglas-fir, and western larch stands that have a lodgepole pine component.

Historical fire return intervals are around 125 years in the Grubb Mountain area. Fire scar recordings were conducted on burned larch in September 1995 on north-facing slopes of the Grubb Mountain area. Scar records on a larch tree showed a tree age of 325 years (felled in 1985), with three scars recording fires during the years of 1785, 1889, and 1939.

Fires in the Grubb Mountain area have been of mixed intensity, with more mortality and stand replacement occurring on drier sites. There have been eight recorded fires within 2 miles of the refuge boundary since 1908; two of these fires occurred on present refuge lands (township 28 north, range 27 west, sections 13 and 24).

The most recent wildland fire was the Little Wolf fire of August/September 1994. This fire had moderate-intense fire behavior and spread through Douglas-fir, larch, and ponderosa pine communities on previous ranch lands within sections 14 and 15, and PCTC lands in sections 3, 4, 10, and 11 north of the refuge boundary. Approximately 300 acres within the refuge were burned. This lightning-caused fire was as a stand-replacement fire. Ponderosa pine and larch seedlings were hand planted in 1995 within the burn area.

Wildland fire season in Montana officially begins May 1 and runs through early September. Seasonal weather patterns may extend or shorten the fire season, resulting in a seasonal-dependent fire risk.

WILDLIFE

A list of animal and plant species that occur on or near the refuge can be found in appendix E.

MIGRATORY BIRDS

Documentation of bird occurrence and use is not well developed for this new refuge. Two point-count surveys were initiated in 2000.

The first survey consists of 20 points along the South Pleasant Valley and the county roads. This survey encompasses various habitats including grassland, wetland, and forest. The second survey is a walking survey along Pleasant Valley Creek. It starts in

riparian forest on the north end of the refuge and ends in riparian grassland by the county road. These surveys were developed to determine species presence and use, to develop a species list for the refuge, and to monitor the effect that implementation of the NRCS restoration projects would have on birds.

The MPIF program uses a system that identifies species of conservation priority in each of its planning units, rather than writing planning information for all species. If conservation measures are focused on these species and their habitats, it is expected that other species in the area will benefit as well. MPIF has identified a pool of species that represents priorities for conservation action within the state. A species may be considered a priority for several different reasons, including global threats to the species, high concern for regional or local populations, and high state responsibility for conserving large or important populations of the species.

MPIF has also identified target habitats for conservation and study in the northern Rocky Mountains. The refuge contains three of these habitats—ponderosa pine forest, grassland, and marsh/wetland.

Water Birds

The Dahl Lake wetland complex is an Intermountain valley wetland system that provides habitat for many species. These types of wetlands support nesting populations of many common waterfowl, shorebird, and other water bird species, as well as some upland species.

The wetland complex has potential for nesting waterfowl and rails, along with the entire Intermountain valley, wetland-priority species and some prairie-pothole species, as defined by Partners in Flight Montana Bird Conservation Plan. These species include the following:

- common loon
- trumpeter swan
- black, common, and Forster's tern
- Clark's and horned grebe
- black-crowned night-heron
- black-necked stilt
- Wilson's phalarope
- yellow-headed blackbird
- American bittern
- Le Conte's sparrow

The complex can provide important migration habitat as well for transient shorebirds, waterfowl, and sandhill cranes.

The remoteness of the refuge, and the potential for less human disturbance and recreation, may encourage use by species that are most sensitive to disturbance. Freeze-up on Dahl Lake generally

occurs by mid-November and ice remains until late March or April, limiting use of the area by late-season migrating and wintering wetland-dependent species.

Waterfowl

Fall populations of waterfowl on the refuge appear to be low compared to other areas in western Montana.

Wetland habitats support many species of waterfowl. Commonly observed species include: mallard, teal, common goldeneye, redhead, ring-neck, lesser scaup, common merganser, gadwall, wigeon, canvasback, hooded merganser, wood duck, northern pintail, northern shoveler, bufflehead, ruddy duck, and Canada goose. Pair-count data has indicated all of these species may nest on the refuge, with the most commonly observed pairs being mallard, lesser scaup, northern shoveler, cinnamon teal, and ruddy duck.

Duck pair counts have been conducted on Dahl Lake and other wetlands since the refuge's establishment. Pair-count data will only establish an estimate of how many pairs are nesting. Average brood size, hen success, and survival to fledging must also be calculated to determine production.

$$\text{Duck production} = \text{number of pairs} \\ \times \text{average brood size} \\ \times \text{nest success} \\ \times \text{constant of } 0.7 \text{ survival to} \\ \text{fledging}$$

Nesting success of approximately 15–20 percent is suggested to maintain stable duck populations (Cowardin et al. 1985, Greenwood 1986, Klett 1988).

Current staffing levels and management obligations do not allow time for these calculations to be determined on site. Data on average brood size is calculated yearly by biologists from the National Bison Range complex, using surveys conducted on WPAs in the wetland management district (WMD), and on Ninepipe and Pablo national wildlife refuges. Hen success and survival are constants, as determined by literature and past nest dragging conducted by the Montana Cooperative Wildlife Research Unit.

The National Bison Range complex completes two aerial surveys for geese that include the refuge. These surveys are done with partners—the CSKT, MFWP, and Avista Utilities. The goose pair-count was not conducted for several years, but has been resumed; these data are important to evaluate population trends from year to year, and are used by MFWP for hunting regulations. The goose brood survey is used to calculate production.

Goose populations and production are high in northwestern Montana, therefore, geese are not a priority species. The goose nesting structures

existed prior to refuge establishment; since they are in good condition and there is not an overabundance of geese in the Pleasant Valley watershed, they will likely be retained.

Nest predation by mammals and, to a lesser extent, by birds is the major proximate cause of nest failure (Cowardin et al. 1985, Greenwood et al. 1987, Klett et al. 1988). Predation can be limited directly through predator trapping, and indirectly through habitat manipulation and expansion to increase nest security. Predator control is often expensive and time consuming.

Another limiting factor to duck production is forage. Aquatic invertebrates play a critical role in the diet of most female ducks during the breeding season. Ducklings feed on aquatic invertebrates until approximately 1-month-old, and then gradually increase consumption of seeds and vegetation. Primary foods of hens and broods of many waterfowl species shift from invertebrates in spring and early summer to seeds and vegetation by fall. While the high-protein foods are required for reproduction and growth, the high-energy foods more available later in the season are critical for migration.

Human disturbance can negatively affect waterfowl production by decreasing the number of breeding pairs, hatching success, and survival of the young. Disturbance during pair bonding, and nest building and initiation can cause waterfowl to nest elsewhere or not at all. Several studies have identified human disturbance as the cause of nest desertion, especially during early incubation (Korschgen and Dahlgren 1992). Flushing hens away from the nests, leaving eggs exposed to predators and the elements, can affect nest success. Human-created trails and markers may also lead to increased predation rates on hens and eggs. Disturbance during brood rearing may break up and scatter broods, leaving them vulnerable to predation, exposure, and starvation.

Shorebirds and Waders

Other wetland-dependent species are important to ecosystem health and many are listed as priority species under the Shorebird Conservation Plan and the MPIF initiative. These species are difficult to record with traditional monitoring and general observation. Monitoring such as taped calls may be needed to record their presence.

Water birds known to nest on the refuge include red-necked and horned grebes, killdeer, and a small colony of black terns. Two pair of sandhill cranes has inhabited the refuge during spring and summer for the last 4 years; colts have been observed, so nesting has occurred. Eared grebes are common on Dahl Lake, and pied-billed grebes were observed on the refuge. Eighteen Wilson's phalarope were observed during the 2002 duck pair counts. Other species migrating through or nesting include the great blue

heron, spotted sandpiper, common snipe, American bittern, sora rail, gulls, and dowitchers. It is unknown to what extent shorebirds are using this wetland complex.

Young shorebirds are especially vulnerable to mortality from hay cutting. In Harney Basin, Oregon, it was estimated that one operator killed 400–600 shorebirds (primarily Wilson's phalarope) by mowing between July 1 and 13 (Oring et al. 2003).

Unlike ducks, shorebirds, and especially the Wilson's phalarope, tend to remain in hay meadows to feed after hatching. Consequently, even the early-nesting species are vulnerable to mowing.

Species of shorebirds known to breed in the northern Rocky Mountains that are listed as priority 3 (important) for conservation value include black-necked stilt, American avocet, greater yellowlegs, willet, spotted sandpiper, Wilson's phalarope, and common snipe. The long-billed curlew is listed as priority 4 (very important). Snowy plover, killdeer, and upland sandpiper, may also occur in the area but are not listed as priority species. Twenty-three additional species occur annually as migrants, six in moderate numbers, and 17 in small numbers.

The American bittern is as a priority 3 species for the MPIF initiative. They are a secretive species, which makes them difficult to monitor and, therefore, it is hard to determine occurrence and abundance. The biological potential exists for bitterns at the refuge; surveys have not been conducted. Bitterns may nest in reed canarygrass (Dechant et al. 1999) and prefer relatively large wetlands (7.5 acres). Bitterns will not tolerate haying, mowing, or grazing during or immediately prior to nesting season.

One of the goals of the U.S. Shorebird Conservation Plan is to ensure that adequate quantity and quality of shorebird habitat is maintained at the local level. The plan addresses individual regional plans, with Lost Trail National Wildlife Refuge falling in the Intermountain West subregion. By monitoring and protecting shorebird habitat, the refuge can aid the Intermountain West in obtaining two of their regional goals. The habitat management goal is to maintain and enhance diverse landscapes that sustain thriving shorebird populations. The monitoring and assessment goal is to acquire information on shorebird distribution and abundance for shorebird conservation.

Other Migratory Birds

The MPIF Plan (2000) and the Service's office of migratory bird management (1995) have prepared lists of bird species of concern.

The Partners in Flight Draft Montana Bird Conservation Plan identifies priority, Neotropical, migratory bird species and associated habitats in Montana. Partners in Flight uses a system that

identifies species of conservation priority in each of its planning units rather than writing plans for all species. Focusing conservation measures on these species and their habitats should benefit other less imperiled species. Species may be considered a priority due to global threat to the species, high concern for regional or local populations, or high state responsibility for conserving large or important populations of these species.

Priority habitats that occur on the refuge include: Palouse prairie, montane shrublands, dry forest, burned forest, moist Douglas-fir and grand fir forest, quaking aspen, cottonwood and quaking aspen, riparian shrub, riparian coniferous forest, prairie potholes, and wetland (see table 6).

Grassland birds show the most consistent population declines of all groups of birds monitored by the breeding bird survey. Loss of habitat, as prairies and grasslands were converted to crop and hay lands, is the primary reason many grassland bird species are on the decline.

Other problems that have plagued the nesting success of grassland species, which could be minimized with refuge management practices, include grazing regimes, invasive plants, habitat fragmentation, and shrub and tree encroachment. The refuge has more than 3,400 acres of native prairie. Much of the converted cropland could also be restored to native grasses.

Two Neotropical migratory bird survey routes have been conducted annually on the refuge since 2000. The first of these routes follows the Pleasant Valley and South Pleasant Valley roads. The other survey is located on Pleasant Valley Creek, running from its inception on to the refuge to Pleasant Valley Road. Migratory bird surveys are conducted in daylight hours using bird songs as the primary method of detection. Neither of these surveys adequately covers upland habitats.

Relatively little is known about the abundance and population trends of most species of nocturnal owls in North America. In the last few decades, there has been increasing concern over the status of both diurnal and nocturnal raptors. Birds of prey are high on the food chain and are highly susceptible to changes in the environment, making them good indicator species.

Most species of owls are poorly monitored by existing Neotropical migratory bird surveys. Broadcast surveys are one of the most widely used techniques to locate and survey owls. Broadcasting recordings of owl vocalization can increase calling rates. In September 1999, standardized owl monitoring surveys were developed—Guidelines for Nocturnal Owl Monitoring in North America (Takats 2001).

Table 6—List of priority, Neotropical migratory birds for habitats on Lost Trail National Wildlife Refuge, Montana

<i>Habitat Type</i>	<i>Priority Species</i>
Palouse Prairie	Burrowing owl Columbian sharp-tailed grouse Grasshopper sparrow Long-billed curlew Northern harrier Short-eared owl
Montane Shrubland	Calliope hummingbird Clay-colored sparrow MacGillivray's warbler Nashville warbler
Dry Forest	Blue grouse Cassin's finch Chipping sparrow Flammulated owl Lewis's woodpecker Red crossbill
Burned Forest	Black-backed woodpecker Olive-sided flycatcher Three-toed woodpecker Townsend's solitaire
Moist Douglas-fir and Grand Fir	Pileated woodpecker Plumbeous/Cassin's vireo Sharp-shinned hawk Townsend's warbler Williamson's sapsucker
Quaking Aspen	Red-naped sapsucker Ruffed grouse
Cottonwood and Aspen	American redstart Downy woodpecker Killdeer Least flycatcher Red-eyed vireo Veery Western screech-owl
Riparian Shrubland	Gray catbird Rufus hummingbird Song sparrow Warbling vireo Willow flycatcher
Riparian Coniferous Forest	Hammond's flycatcher
Prairie Potholes	Black tern Black-necked stilt Clark's grebe Forster's tern Horned grebe Wilson's phalarope
Wetland	American bittern Common loon Common tern Yellow-headed blackbird Trumpeter swan

Western and mountain bluebirds are found in the Pleasant Valley. Populations of mountain bluebirds have declined about 6 percent annually across

western North America, according to the national breeding bird survey. There has been a significant decrease in natural nesting cavities for bluebirds throughout the country; increased urbanization has led to a corresponding decrease in the number of dead trees. In addition, wooden fence posts are being replaced with metal posts.

Compounding the problem of habitat loss has been the introduction of two imported species, the house sparrow and European starling, which are cavity nesters that aggressively compete with bluebirds for cavities. Bluebird populations have rebounded since the box program became popular in the 1980s.

A bluebird box trail was established along the refuge road system in spring 2001. The Pleasant Valley School monitors and maintains the boxes. Although bluebirds are not currently a priority species for Montana, the maintenance of this bluebird trail is useful as an educational tool, to interest students and the public in Neotropical



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Mountain Bluebird

migratory birds and their conservation.

Some 85 species of North American birds excavate nesting holes, use cavities resulting from decay (natural cavities), or use holes created by other species in dead or deteriorating trees. The absence of suitable nest sites is usually considered the limiting factor for cavity-nesting species (Thomas et al. 1979). The Partners in Flight Montana Bird Conservation Plan specifies the retention of all large snags and broken-top trees. The plan has a critical objective of management for adequate numbers over the landscape to maintain viable populations of Lewis's woodpecker and flammulated owl.

Other cavity-nesting priority species in Montana that would benefit from the retention of snags include black-backed woodpecker, three-toed woodpecker, Williamson's sapsucker, pileated woodpecker, downy woodpecker, red-naped sapsucker, pygmy nuthatch, red-breasted nuthatch, white-breasted nuthatch, hairy woodpecker, and western screech-owl.

OTHER WILDLIFE

This section describes the mammals, resident birds, fish, amphibians, and reptiles of the area.

Large Mammals

MFWP uses aerial surveys, ground surveys, and harvest data to monitor population trends and composition of mule deer, white-tailed deer, elk, moose, black bear, and mountain lion populations in northwestern Montana. This data is used to determine the population health of individual species, project population estimates, and set hunting seasons. Hunting is the primary tool used by MFWP to manage ungulate populations (Canfield et al. 1999).

The refuge is important winter habitat for a herd of approximately 300 elk. Moose are primarily spring, summer, and fall residents. Fluctuations in population sizes are natural and may occur for many reasons.

White-tailed deer are year-round residents of the refuge and mule deer primarily use the refuge (uplands) in fall and winter. Their populations have been steadily increasing in the past 4 years. MFWP monitors both species to facilitate adaptive management through harvest regulations.

Elk were not plentiful in the Pleasant Valley and Fisher River watershed until MFWP made transplants of 27 and 29 elk into the Wolf Creek drainage in 1927 and 1928, and 105 elk into the Fisher River watershed in 1929. These elk thrived and multiplied into the healthy, self-sustaining herd present today. Refuge lands are primarily elk winter range.

The refuge is in the state's Salish elk management unit (northwestern Montana from Eureka to the Flathead Indian Reservation northern boundary; figure 9). The refuge is part of hunt district 103. Elk populations within the hunting district are consistently above MFWP objective levels. Data from aerial surveys conducted each spring by MFWP show the population goals for herd numbers are being met for this unit at approximately 2,000–3000 animals. The winter bull-to-cow ratio is 10 per 100 and the population maintains a minimum winter calf-to-cow ratio of 30 per 100.

Moose are generally observed in wetter areas on the refuge, including Pleasant Valley Creek and at Moose and other ponds, during May and June. Calving may occur on the refuge, but has not been documented. Moose use wetlands for feeding, loafing, and resting. Cow moose are more readily observed in June with their calves.

Some MFWP surveys show trends on a regional or area-wide scale. These surveys are still valuable, as the refuge is only a small part of the local ecosystem upon which these species depend. Anything that

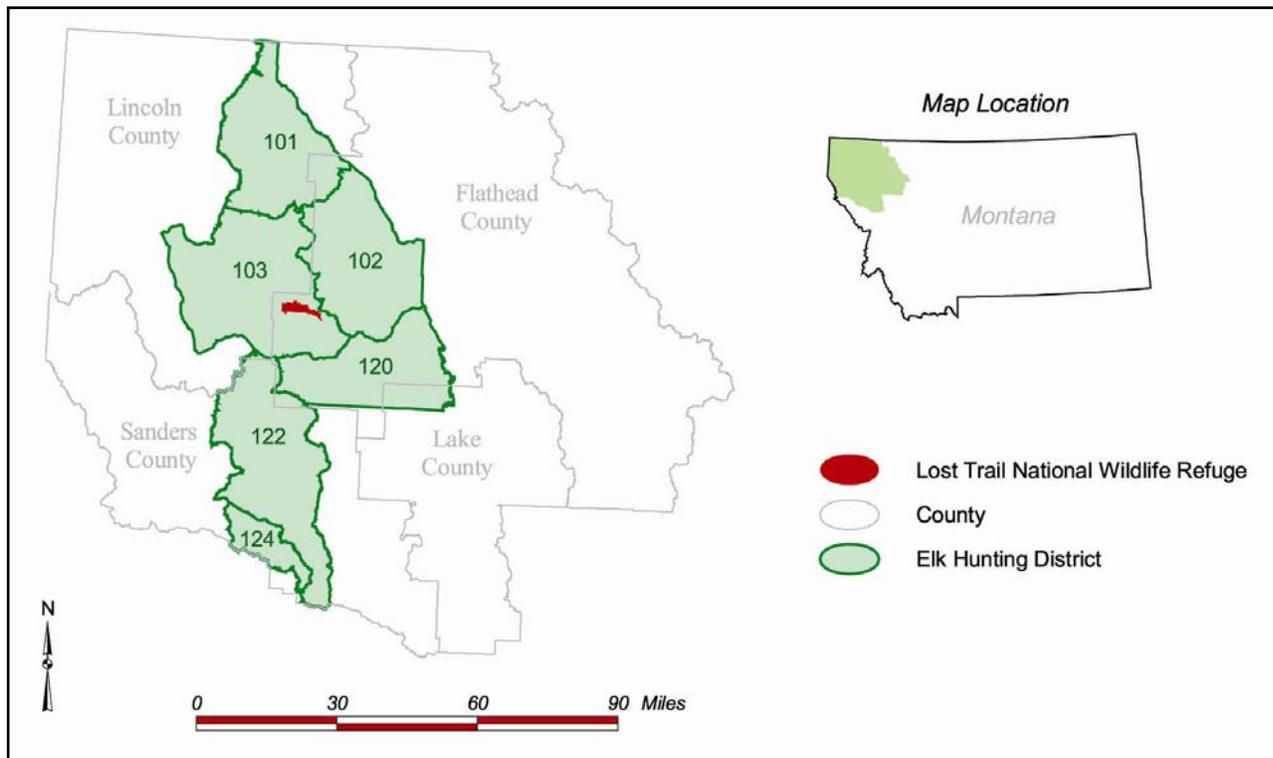


Figure 9. Elk management units, Montana

affects populations outside the refuge will project onto those individuals using the refuge. Refuge staff does not conduct formal surveys; however, they do record general observations that are valuable in monitoring herd health on the refuge (i.e., wintering elk numbers and individual moose numbers).

Winter is a critical time for ungulate survival. Animals that may have occupied thousands of acres of summer/fall range can be seasonally confined to relatively restricted geographic areas. These wintering areas have limited forage and extreme environmental conditions, which can cause physiological stress. Almost 40 percent more food is required in winter to generate energy for daily metabolic and activity requirements. Mackie et al. (1998) observed that, “Deer survive primarily by supplementing energy resources accumulated prior to winter with energy intake from submaintenance winter diets.” This requires behavior that emphasizes energy conservation. Inactivity provides an energetic advantage for animals exposed to cold; forced activity caused by human disturbance exacts an energetic disadvantage.

The refuge contains approximately 30 miles of interior fence, 10 miles of fence along the county road, and 20 miles of exterior boundary fence. These fences were important for livestock grazing management prior to refuge establishment; however, they are not necessary for refuge management and can be harmful to wildlife. Wildlife can become entangled in fences, which can cause serious injury or death to an animal. At least five animals (four elk

and one moose calf) have been found caught in refuge fences in the last 2 years.

Fences can also pose a hazard to ungulates by blocking escape routes, allowing predators to more easily catch and kill animals. This is especially true of young animals that cannot follow adults over a fence. Young animals are also separated from their mothers by fences when the adult jumps the fence and the young cannot follow. This results in a young animal stranded, often running a fence line until it becomes caught in the fence or is killed by a predator. The refuge receives up to 3 feet of snow in the winter. High snow levels may impede movement of ungulates by blocking access under fences.

Chronic-wasting disease is a transmissible spongiform encephalopathy of deer and elk. Although the exact causative agent is unknown, the disease is related to infectious proteins that are resistant to normal, metabolic breakdown processes and abnormally accumulates in the brain and brain stem. Consequentially, neurons die, which results in brain impairment. Eventually, diminishment of body condition and death occur.

An increased distribution of chronic-wasting disease within and among states, although not Montana, combined with high prevalence reported in some states, has resulted in national and international attention to this disease. The scope of this wildlife disease, combined with Service responsibilities for wildlife that span jurisdictions, make it essential that the Service cooperate with other agencies in addressing chronic-wasting disease.

Small Mammals

Since Lost Trail has only been managed as a national wildlife refuge starting in 1999, little is known about small mammal species and demographics on the refuge. Several species were identified during amphibian trapping conducted in 2000. Small mammals that are expected to reside on the refuge are listed in appendix E (data obtained from the Flathead National Forest).

Mammals that are known to occur in the area include the fisher, river otter, marten, Canada lynx, wolverine, and bobcat. These species are elusive, but probably inhabit refuge lands occasionally. A wolverine was seen on the refuge in 2000 and a river otter in 2002. Beaver and muskrat appear in the refuge's wetlands and ditches. Columbian ground squirrels, coyotes, and badgers are common.



Marten

Erwin and Peggy Bauer/USFWS

Ground squirrels are an important source of protein for most predators in northwestern Montana including birds of prey, weasels, canids, felids, and bears. Columbian ground squirrels can cause extensive habitat damage and compete with other wildlife for forage. Ground squirrel digging may accelerate soil erosion. Lambeth et al. (1982) found that, up to a point, ground squirrel populations increased with plant retrogression. Other research has indicated that ground squirrels may move out of stands of heavy vegetation to more open grass habitat.

Resident Birds

Resident (nonmigratory) birds on the refuge include common species such as the black-capped chickadee, great horned owl, hairy woodpecker, and red-breasted and white-breasted nuthatches. Less common residents include the pygmy nuthatch, brown creeper, and great gray owl. Resident upland game birds found on the refuge include spruce grouse and wild turkey.

Turkey was transplanted to the Pleasant Valley area in 1999 to increase hunting opportunities. This nonnative species is not a priority for refuge management.

Grouse are a native component of the Pleasant Valley ecosystem and provide public use opportunities on the refuge. They are not, however, a priority species for which the refuge was established. MFWP region 1 data suggests that grouse populations are stable region-wide. Nearly 50 percent Montana's mountain grouse harvest comes from this region, in which the refuge is included, indicating a consistently high population in the area of the refuge and the ability to tolerate hunting pressure.

Another resident species, the golden eagle, has nested 100 feet south of the refuge for many years. The golden eagle is protected under the Bald Eagle Protection Act of 1940, as amended in 1962. Montana's population of golden eagles may be declining due to low productivity (Canfield et al. 1999).

Some resident species may not be detected using Neotropical migratory bird surveys. Examples include species such as owls that are vocal predominantly in the evening, woodpeckers whose species-specific drumming patterns are hard to distinguish, and marsh birds.

Fish

The MFWP provided historical information from fish-stocking records, fish-planting reports, and creel surveys. Rainbow trout, cutthroat trout, and brook trout were stocked in the Pleasant Valley Fisher River between 1938 and 1952, likely between Loon Lake and Silver Butte Fisher River (figure 7). Game wardens conducted creel surveys in the 1950s and 1970s that showed angler success was excellent for brook trout and cutthroat trout up to 12 inches. Neighbors in the Pleasant Valley remember strong numbers of trout as far as just west of the refuge.

Unfortunately, no in-depth information exists from historical fish surveys. Very little recruitment to trout populations was accomplished since the upper Pleasant Valley-Fisher River drainage was heavily affected by agricultural practices, logging, and road building for the last 100 years (Hensler 2001).

The MFWP conducted fish surveys in the Pleasant Valley Fisher River drainage between 1993 and 2000, and collaborated with the University of Montana Wild Trout Genetics Lab. Brook trout and redband shiners were the only species sampled in the area of the refuge. Below the refuge (below Big Meadows dam) species captured were brook trout, mountain whitefish, redband shiner, large scale sucker, northern pike minnow, longnose dace, and torrent sculpin. No cutthroat species in tributaries above Deer Creek were captured. Below Deer Creek, redband trout and westslope cutthroat trout were present and various levels of hybridization existed.

Pleasant Valley Creek affects these fisheries by introducing water that warms the mainstem of Fisher River since Pleasant Valley Creek has temperatures that range from 32–77° F and areas with very high levels of fine (silt) substrate (Hensler 2001).

The MPC surveyed Dahl Lake and Meadow Creek in 1996 to determine fisheries potential. The MFWP surveyed Pleasant Valley Creek in 2000. The only fish sampled were downstream of Forest Service road 1019 and included the redband shiner, yellow perch, northern pike minnow, pumpkinseed, and suckers. Stunting characteristics were observed in all fish populations except redband shiners and suckers (Mabbott 1996). The dissolved oxygen in Pleasant Valley Creek is sufficient to support a cold-water fishery.

Pleasant Valley Creek does not currently support redband, westslope cutthroat, or bull trout (Hensler 2001, Mabbott 1996). The creek drains into the Fisher River where bull trout (species of concern) are being restored. The MPC report recommends introducing redband and westslope cutthroat trout.

Columbia River redband trout, a subspecies of rainbow trout, is native to the Columbia River drainage. The U.S. Fish and Wildlife Service, American Fisheries Society, and all states throughout its historic range (Idaho, Oregon, Washington, Nevada, California, and Montana) consider it a species of special concern. The USDA Forest Service and the Bureau of Land Management classify the redband trout as a sensitive species. In 1994, the Biodiversity Legal Fund of Colorado and a private individual from Kalispell formally petitioned the Service to consider the Kootenai River population of redband trout as an endangered species; the petition was dismissed due to lack of information (Muhlfield 2001).

It is probable that redband trout historically occurred in Pleasant Valley Creek, but current water temperature is too high and there has been too much siltation to support redband trout. Redband trout are found downstream in the Fisher River. Adult redband trout use deep microhabitats (greater than 1.5 feet), with low to moderate velocities (less

than 1.5 feet per second). Young select slow water (less than 0.4 feet per second) and shallow depths (less than 0.7 feet) (Muhlfield 2001).

Westslope cutthroat trout is native to Montana. Its spawning and rearing streams tend to be cold, nutrient-poor, pool habitat, and have more cover than uniform, simple habitat (Gardner 2001). Adults need slow-moving pools, which do not fill with ice, to survive the winter (Brown and Mackay 1995). Loss of habitat is the main problem due to loss of stream water to irrigation and barriers created by dams and road culverts (Gardner 2001).

Amphibians and Reptiles

A researcher from the U.S. Geological Survey (USGS) searched 24 sites on the refuge for reptiles and amphibians in 2001 and 2002. The long-tailed salamander, Pacific tree frog, and Columbia spotted frog, and boreal toad (species of concern) were all found to breed on the refuge. Also documented were common and terrestrial garter snakes and the painted turtle.

Reptiles and amphibians are important components of the biological integrity and functioning of an ecosystem. There are known and suspected declines of amphibians throughout North America, with a significant proportion of amphibians native to western United States (Corn 2000).

Hossack (2003) explains, “In response to documented and suspected declines in the United States, a national effort identified as the ‘Amphibian Research and Monitoring Initiative’ was launched in 2000 to determine the status and trends of amphibian populations on Department of Interior lands nationally and to provide information useful in determining causes of declines.” To determine the cause of amphibian and reptile declines as well as the scope of a decline, it is essential to first determine a baseline for comparison.

Bullfrogs are not native to Montana. This species has been widely introduced across the United States and now exists along the Bitterroot, Flathead, and Clark Fork rivers. Amphibian surveys have failed to locate this species at or near the refuge. Bullfrogs can affect amphibian and reptile populations directly through predation and indirectly through the avoidance of sites where bullfrogs are present. Bullfrogs have been implicated in the declines of several amphibian and reptile species. They also prey on ducklings.

SPECIES OF CONCERN

The ESA requires federal agencies to carry out conservation (recovery) programs for listed species and to ensure that agency actions are not likely to jeopardize the continued existence of listed species or adversely modify or destroy their critical habitat. Section 7(a) of the ESA requires federal agencies to

evaluate their actions with respect to any species that is listed as endangered or threatened and with respect to its critical habitat, if any is being designated. Federal agencies are to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of any species listed as endangered or threatened, or to destroy or adversely modify its critical habitat.

Species of concern for the refuge are listed in Table 7. They include federally endangered, threatened, proposed, and candidate species in Flathead County, Montana, that have the potential to occur on the refuge include the grizzly bear, gray wolf, Canada lynx, bald eagle, bull trout, and Spalding's catchfly.

Table 7. Species of concern in proximity to Lost Trail National Wildlife Refuge, Montana

<i>Common Name</i>	<i>Classification</i>	<i>Sighted on Refuge</i>
Grizzly bear	Federally threatened	
Gray wolf	Federally threatened	✓
Canada lynx	Federally threatened	✓
Bald eagle	Federally threatened	✓
Trumpeter swan	Montana species of concern, priority 1*	
Black tern	Montana species of concern, priority 2*	✓
Bull trout	Federally threatened	
Boreal toad	Montana species of concern category S3	✓
Spalding's catchfly	Federally threatened	✓

*Classification of the MPIF Bird Conservation Plan

The trumpeter swan and black tern are also addressed as species of concern. The MPIF considers the trumpeter swan a threatened species. The Service has listed the black tern as a nongame bird of management concern.

Grizzly Bear

Where grizzly bear habitat was once continuous in the Rocky Mountain ecosystem, habitat fragmentation from human settlement and development has created isolated populations of grizzly bears. It is important to the survival of the species that bears from one localized population come in contact with individuals from other populations to maintain genetic variation. Potential linkage areas across Highway 2 remain between the towns of Marion and Libby, Montana. Grizzly bear recovery biologists believe that securing the future of the grizzly bear is dependant on maintaining opportunities for linkage of wildlife populations across areas of human development (Serveen et al. 2001).

The refuge is in an area classified as a management situation II under the Interagency Grizzly Bear Guidelines (USDA Forest Service 1986). Although grizzly bears occasionally inhabit the area, lack of highly suitable habitat and security precludes extensive use.

For the grizzly bear, preserving the linkage between populations is as critical to long-term conservation of the species as managing individual populations. The refuge is part of an important linkage corridor for grizzly bears—between the northern Continental Divide ecosystem (NCDE) and the Cabinet/Yaak ecosystem (CYE).

Studies have shown that ground squirrels may be important as a source of protein to grizzly bears, and show that restricted availability of animal protein may limit grizzly populations (Nagy et al. 1983, Hechtel 1985, Hamer et al. 1978, Stelmock 1981).

In the NCDE, livestock depredation was the most common offense for which a bear was relocated (Thier and Sizemore 1981). These relocations were much less successful than relocations for other offenses (success being no return and no further conflict). Knight et al. (1985) reported that depredations (livestock and property) by grizzlies were the leading cause of nonhunting mortality in the NCDE from 1975 to 1984.

It is crucial to the recovery effort that the public understands reasons for recovery actions, generating tolerant or positive attitudes toward grizzlies. The interagency grizzly bear coordination team has appointed an information and education subcommittee to develop education programs and disseminate information. Private conservation organizations interested in the recovery of grizzly bears have also provided valuable assistance when they include appropriate information in their publications and news releases.

Gray Wolf

Because wolves and other large carnivores have large home ranges, attention needs to be focused on the habitat values of both public and private lands. Private lands, in particular, have substantial value to wildlife because they frequently occur at low elevations that have moderated extreme weather conditions such as deep snow.



John and Karen Hollingsworth/USFWS

Lost Trail is one of the first national wildlife refuges in the Intermountain West to support the gray wolf. Wolves have attempted to colonize the Pleasant Valley twice in the last decade. In both instances, the wolves started to prey on livestock and were subsequently killed.

One of the major limiting factors to wolf survival is an adequate prey base. The refuge is an important winter range for elk in the Pleasant Valley (Ray Washtak, refuge manager, personal communication, 2004).

Canada Lynx

Canada lynx occur in northwestern Montana, but have not yet been documented on the refuge. Canada lynx habitat consists of a mosaic of forest habitats including early successional forests that support high densities of snowshoe hare and late-successional forests that contain cover for kittens and for denning. Wildfire, wind-throw, and disease are all natural processes that create these forest conditions (Bailey et al. 1986, Fox 1978, Keith and Surrendi 1971, Koehler 1990, Koehler and Brittell 1990).

Early successional forests where snowshoe hare are plentiful are favored by lynx for hunting. Such forest is created from fires (Bailey et al. 1986; Fox 1978; Keith and Surrendi 1971; Koehler 1990, 1991), timber harvesting (Conroy et al. 1979; Koehler 1990, 1991; Litvaitis et al. 1985), and wind-throw and disease (Koehler and Brittell 1990). Hares are more likely to use regenerating forest with dense understory, than uncut or even-aged stands with little understory (Monthey 1986; Thompson 1988; Koehler 1990, 1999).

Although early successional forests are common on surrounding PCTC lands, these stands may not be managed to support the dense understory that is required for high snowshoe hare populations. For example, precommercial thinning is detrimental to snowshoe hare habitat, but is a common management tool on productive timberlands.

Although disease and insect attacks may increase fuel loads and the risk of large, high-intensity fires, they also provide dead and downed trees used for denning and cover. Late-successional, mature forest that contains large, woody debris such as fallen trees or upturned stumps are required habitat for Canada lynx denning (Berrie 1973, Koehler 1990, Koehler and Brittel 1990, Kesterton 1988, Murie 1963). Small-sized parcels (2.5–5 acres) of late-successional forest appear to be adequate for den sites, but they must be connected by corridors of cover to permit females to move kittens to alternate den sites that provide suitable access to prey.

Bald Eagle

A bald eagle has nested in the aspens on the north side of Dahl Lake for the last several years.

Guidelines developed by the Bald Eagle Recovery Team (USFWS 1986) recommend a goal of at least one fledged per year on average per nesting pair and an average nest success rate of not less than 65 percent over a 5-year period.

Trumpeter Swan

Historic accounts indicate that the Flathead Valley is one of three areas where suitable habitat existed and trumpeter swans were once a common breeding species in the United States (Banko 1960). When swans were eliminated from much of their range, they not only lost a major segment of their population but perhaps of greater importance, they lost flyway traditions.

In recent times, there have been sporadic reports of swans wintering in northwestern Montana along the Flathead and Clark Fork river drainages. Trumpeter swans are occasionally observed on Island and Flathead lakes, and other locations in northwestern Montana. The swans have also been observed during migration. The majority of trumpeter swans in the Rocky Mountain population concentrate on a small number of wintering grounds. Severe losses could occur from disease outbreaks, severe winter weather, and lack of forage.

Trumpeter swan habitat exists around Dahl Lake. A pair of trumpeters was documented in the Pleasant Valley area one summer, but breeding was not recorded.

Black Tern

Black terns have shown continent-wide population declines since 1960 and are currently listed as threatened or endangered in six states.

The black tern is listed as a species of concern in 18 other states and provinces (Casey 2000). In Montana, the black tern is listed as a species of special concern with a ranking of “vulnerable” under the Natural Heritage Program classification system (Shuford 1999), but has not been consistently monitored.

The Service has listed the black tern as a nongame bird of management concern (USFWS 1995b, 2002). Loss of potential nesting and foraging habitat for black terns is greatest in northeastern and northwestern Montana.

Black terns have been documented to nest around Dahl Lake. Black tern production on the refuge was documented by the MFWP in 1999. Refuge staff observed terns in 2000 and 2001.

Bull Trout

Bull trout are native to Montana and are federally listed as threatened. This species requires very cold, clean water (less than 64° F). Bull Trout Interim Conservation Guidance (USFWS 1998a) includes an objective for maintaining or restoring cold-water

temperature contributions of non-fish-bearing tributaries.

Boreal Toad

Boreal toads have experienced drastic declines in the southern Rocky Mountains (Corn et al. 1989), and recent surveys in western Montana found it to be less common than expected (Hossack et al. 2001). The boreal toad is a candidate species in Colorado and Wyoming, but is not yet listed in Montana. It was once recorded much more frequently in Montana than in the previously mentioned states.

The refuge is a survey site as part of the national amphibian research and monitoring initiative launched by the USGS. The refuge has documented one of the largest known populations of boreal toads reproducing in the northwestern Rocky Mountains, based on the number of larvae observed (USGS 2001, 2002). The USGS found upwards of 40 breeding females at Lower Moose Pond, and more than 200 breeding females on the south side of Dahl Lake.

The extent of boreal toad populations in Montana is unknown due to limited monitoring efforts. The USGS completed surveys in Montana during the last few years in more than 3,000 wetlands (Hossack, USGS biologist, personal communication). Boreal toads were found reproducing at only 3 percent of

these sites (a maximum of 10 females at any one site). Hossack et al. (2001, 2002) found evidence of boreal toads breeding on 5 of 20 sites surveyed in 2001 and 15 of 28 sites in 2002. Boreal toads were located at less than 5 percent of other forested sites surveyed in Montana since 1999.

Evidence from the refuge and Glacier National Park show that breeding sites are often clustered in a small area, hence, are at risk to environmental changes and subsequent local extinction.

Spalding’s Catchfly

Spalding’s catchfly is a native forb of the carnation family that occurs in mesic slopes, flats, or depressions of open grasslands. It is associated with Idaho fescue, rough fescue, and bluebunch wheatgrass, occasionally interspersed with conifers. Twenty catchfly populations have been documented in northwestern Montana in Flathead (6), Lake (2), Lincoln (6), and Sanders (6) counties.

A new population of Spalding’s catchfly was discovered on the refuge (figure 10) in 2002. This population is one of the largest documented sites in Montana, containing a minimum of 300 plants, within about 9.5 acres. Part of this population exists on state land [Montana Department of Natural Resources and Conservation (DNRC)] within the refuge boundary.

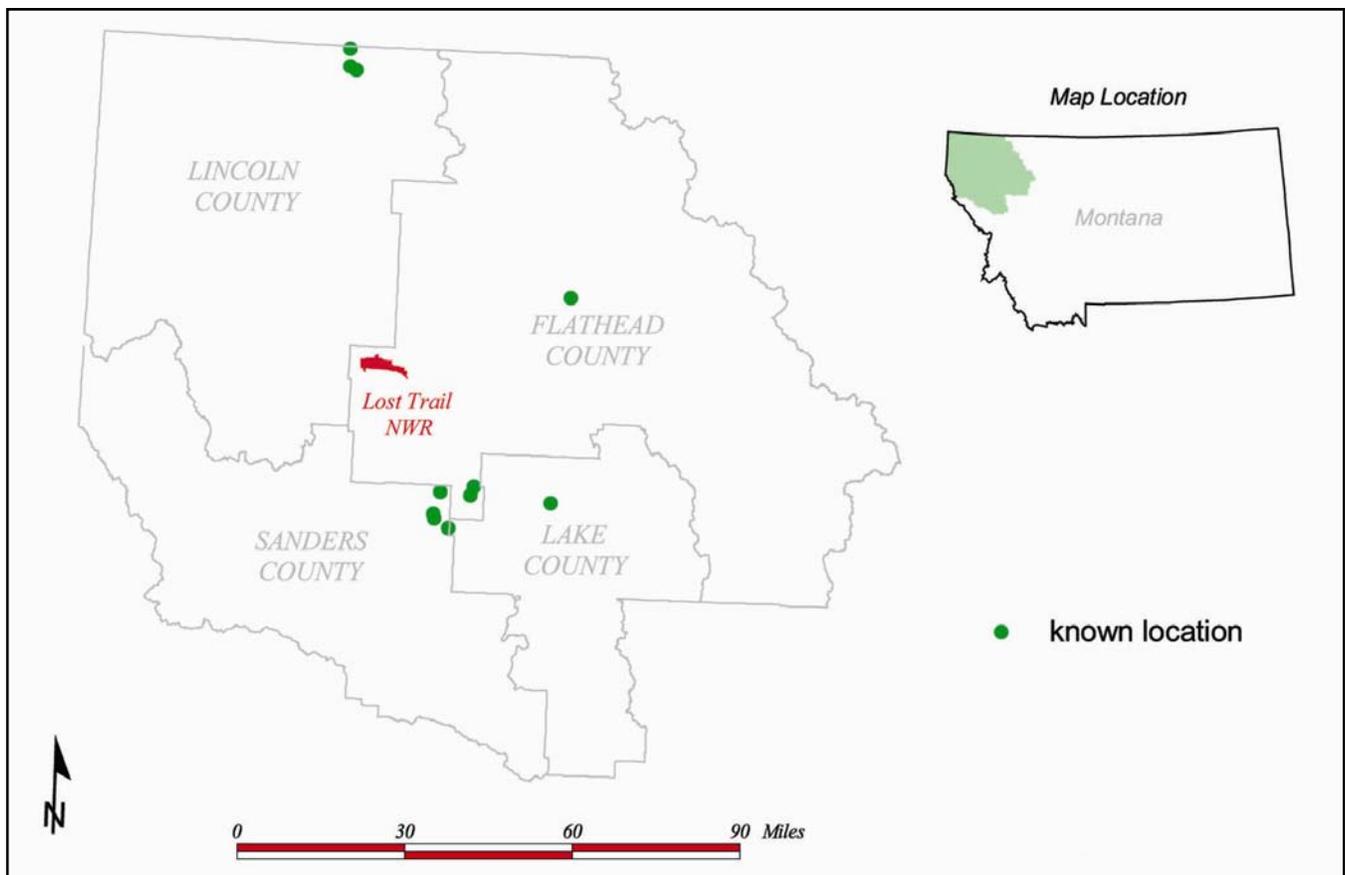


Figure 10. Distribution of Spalding’s catchfly in Montana

The refuge has nearly 2,500 acres of Idaho and rough fescue-dominant habitat that could support Spalding's catchfly (figure 4). It is expected that more plants will be discovered as inventory efforts continue.



Stacy Hoehn/USFWS

The refuge biologist records observations about the catchfly plant before her.

Since there are only 53 known populations of Spalding's catchfly in fragmented populations across the northwestern United States, the relatively large population located on the refuge and any new populations that may be discovered are significant to the plant's survival.

Many catchfly plants on the refuge are at risk of being displaced by nearby populations of invasive plants, especially spotted knapweed and sulfur cinquefoil. Invasive plants displace the catchfly and compete with it for water, nutrients, light, and pollinators (Lesica and Heidel 1996, Montana Natural Heritage Program 1998).

WILDERNESS REVIEW

To be designated a wilderness area, lands must meet certain criteria as outlined in the Wilderness Act of 1964:

- Generally appears to have been affected primarily by the forces of nature, with the imprint of human work substantially unnoticeable.
- Has 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 also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

The refuge meets the size and scientific, scenic, and historical value criteria, but is impacted by roads, fences, and extensive human effects from grazing and draining wetlands, which restrict it from being designated a wilderness area.

CULTURAL RESOURCES

From thriving Native American tribal life to extensive European settlement, the archaeological and historical resources of the Pleasant Valley and the refuge provide insight to the people who lived there, and the prosperity and desirability of the area.

NATIVE AMERICANS

As documented through oral traditions and archaeological remains, Native Americans have long used western Montana and were first written about by Lewis and Clark during their journey through the area almost 200 years ago. According to the cultural resource overview prepared for the Service by the Confederated Salish and Kootenai Tribal Historical Preservation Office (THPO), the native people of the area were the Bitterroot Salish, Pend d'Oreille, and Kootenai. Today, all three tribes make up the CSKT of the Flathead Indian Reservation (CSKT 2000).

Physical evidence of Native Americans in the Kootenai River Valley comes from the Libby Dam cultural resources project in 1977, which found occupation sites and campsites located on terraces above the active flood plain. Included in the finds were fire-broken rocks, possibly from hearths or baking ovens. During 5,000 years of prehistory in the Kootenai River Valley, people wintered in the valley bottoms and moved to higher elevations to hunt and gather foods (CSKT 2000).

The area around the refuge, including Pleasant and Lost Prairie valleys, was within the immediate home range for the Kootenai people. Even though they were trading partners with the Salish and Pend d'Oreille tribes, the Kootenai spoke a different language. The Kootenai place name for Pleasant Valley is "yaqakmu'inki" and it was a major travel corridor from the Little Bitterroot River and Flathead Lake to the Upper Fisher River and Kootenai River Valley (CSKT 2000).

Flatheads and Kootenai traveled to Wolf Creek to hunt deer and elk in the fall, and went to huckleberry grounds in the summer (Wakefield 1998). Native Americans harvested camas bulbs along the shores of Dahl Lake and in low wetlands during early spring. The Kootenai people at Wolf and Fisher rivers traded furs with settlers in the early 1800s (CSKT 2000).

The granddaughter of settler Ed Jackson (Jackson Ranch), Jean Jackson Wakefield (1998), mentions finding teepee rings by Pleasant Valley Creek when she was young, as well as Native American graves behind the Jackson Ranch (now part of the refuge, north of headquarters). A petroglyph site on the refuge has been documented by the Service.

EUROPEAN SETTLEMENT

Some of the earliest Europeans to use Pleasant Valley were those from Plains (Wild Horse Plains), Montana. They brought cattle in from the west along Fisher Creek to summer range in the valley. About 1886, Charlie Lynch took up a homestead just south of Lynch Lake. Others soon followed, most being cattlemen moving from Plains to the valley.

Bill Orr and Frank Gardiner settled in Pleasant Valley in 1888. Orr homesteaded where the present-day refuge shop buildings are located, with Gardiner setting up just east of his partner. Bill Orr built his ranch house in 1914; it also served as the Pleasant Valley post office from 1916 to 1933. The building still stands today and provides housing for refuge staff.

Jack Nowlan homesteaded in Pleasant Valley in 1888, near the refuge's current headquarters. Nowlan and Edwin Vesey claimed the original water rights on Pleasant Valley Creek, just west of the ranch. In 1910, Ed Jackson purchased the Nowlan homestead, which became the Jackson Ranch. Over the next 27 years, he built a variety of structures, including a house, horse barn, cow barn, and log garage. The structures are still standing and in use, with the exception of the cow barn, which burned down.

George and Frank Doll were among the early homesteaders that set up within the present-day boundary of the refuge. Frank and his wife, Josephine, homesteaded along the east side of Medicine Lake (now known as Dahl Lake) in 1900, with his brother settling northwest of him. The Dolls and a partner from Spokane organized the Pleasant Valley Ranch Company in 1912. They bought and leased other homesteads in the valley, and sold the company in 1927. Frank and Josephine's house was torn down in the 1990s.



Ray Washak/USFWS

Several structures remain from the Lost Trail Ranch.

The Great Northern Railroad's main east-to-west line ran through Pleasant Valley from 1892 to 1904. The railroad grade reached 1.5 percent at locations

on its climb from Bitterroot Lake to Pleasant Valley. This steepness, and the large number of curves along the route, led the Great Northern to build a different track west from Whitefish, to connect with the railroad at Rexford, Idaho.

During the Great Northern Railroad's operation, a railroad stop and section house were built just east of the current refuge headquarters. A construction camp and railroad gravel pit existed just north of this area. The Pleasant Valley railroad line closed in October 1904. Two outside ovens for baking were built and were still present in the area in 1994.

The first Pleasant Valley School opened in 1903 in an old railroad cabin; it is located near the gravel pit behind the Jackson Ranch (now on an inholding within the refuge boundary). After 2 years, the school was moved approximately 2 miles east, and was located there until 1914. From 1914–1960, the Pleasant Valley School was situated near the junction of Lost Prairie Road and the old railroad grade. Today, the K–8 Pleasant Valley School is located south of the refuge on Lost Prairie Road.

The Pleasant Valley Road opened in 1917 and followed the railroad grade. Although residents made rail fences from the old railroad ties, old railroad spikes can still occasionally be found coming out of the roadbed.

In 1971, an absentee owner from San Francisco purchased the Pleasant Valley Ranch and renamed it Lost Trail Ranch. The ranch was resold in 1981 to absentee partners who extended the boundaries through purchases of the Jackson and Orr–Gardiner ranches. In 1996, the MPC purchased the Lost Trail Ranch as potential mitigation for wetland loss on the Flathead WPA. In 1999, MPC conveyed approximately 3,100 acres of the ranch to the Service, which purchased the remaining acreage from MPC.

The Jackson and Orr–Gardiner ranches are eligible for nomination to the National Register of Historic Places. The Doll Ranch has not been evaluated for eligibility for nomination to the register.

SOCIOECONOMIC SETTING

Lost Trail is a remote refuge, located in one of the fastest growing counties in Montana. The refuge is located in southwestern Flathead County, Montana. Flathead County is 5,098 square miles in size.

Flathead County has been classified by the U.S. Census Bureau as nonmetropolitan, where a metropolitan area is described as having “a large population nucleus, together with adjacent communities having a high degree of social and economic integration with that core. Metropolitan areas comprise one or more entire counties....”

POPULATION

According to the most current published statistics (for 1990–2001) by the U.S. Census Bureau, the population of Flathead County is 76,269, representing a 25.8 percent increase in population from 1990. There are 14.6 persons per square mile in the county, and homeownership at that time is reported at 73.3 percent.

Flathead County experienced a 22.9 percent growth between 1991 and 1999, while the state as a whole increased only 10.5 percent (U.S. Department of Commerce 2001). The city of Kalispell (30 miles southeast) experienced a 20 percent growth in population during these years. More telling, the population of the greater Kalispell area (including the communities of Evergreen, Columbia Falls, and Whitefish) increased 25 percent (Montana Department of Commerce 2001).

Resident populations located west of the refuge are small, with Libby having about 2,226 people and Eureka having about 1,105 people (Montana Department of Commerce 2001).

The area of the refuge cannot be classified as either predominated by minority populations (96.3 percent of the population is classified as white by the U.S. Census Bureau in 2000), nor a predominantly low-income population (homeownership is reported at 73.3 percent; median household income and per capita income for 1999 are reported at \$34,466 and \$18,112 respectively). The percentage of persons living below poverty in 1999 is reported by the same federal agency at 13 percent, which does not represent a sizeable amount in the total population of Flathead County. Furthermore, while the refuge is located near Native American tribal lands, the refuge is not within the boundaries of any Indian reservation.

ECONOMIC SITUATION

The development trend in the area has increased considerably in the last 20 years—Flathead is one of the fastest growing counties in Montana. “Ranchettes” of 2–20 acres have increased as the region’s natural amenities attract new residents, vacation homebuyers, and businesses.

Oil drilling on adjacent lands is unlikely. A test well drilled in 1983 hit Precambrian Rock, which is not known for good oil production; the well was plugged. It is unlikely that this area will be explored for oil production again (Jim Halvorson, petroleum geologist, personal communication).

The refuge is surrounded by two types of land use—agriculture (mainly cattle ranching) and industry (timber harvest and extraction). The past uses of the refuge, as well as of surrounding lands on the valley floor, have been primarily for raising beef cattle.

Most lands managed by the timber industry, surrounding the refuge, allow various recreational uses.

The U.S. Census Bureau’s “Montana: 2001, County Business Patterns” report identifies a total of 3,279 business establishments in Flathead County (table 8).

Table 8. Most numerous business in Flathead County, Montana, 2001

<i>Business Type</i>	<i># of Businesses</i>
Retail trade	511
Construction	482
Accommodation and food services	311
Other services (repair, maintenance, religious organizations, etc.)	288
Health care and social assistance	273
Professional, scientific, and technical services	265
Finance and insurance	161
Manufacturing (includes wood products)	140
Transportation and warehousing	117
Wholesale trade	105
Arts, entertainment, and recreation	84
Forestry, fishing, hunting, and agriculture support	73
Information	49
Unclassified	43
Mining	11

The Federal Bureau of Economic Analysis reports the following data for Flathead County in the “Total Full-time and Part-time Employment by Industry” report (regional economic accounts) for 2000 in table 9.

The median household income and per capita income in Flathead County for 1999 are reported at \$34,466 and \$18,112 respectively. The percentage of persons living below poverty (in the same year) is reported at 13 percent.

There were more than 684,600 visitors to Montana in 1991 (Montana Department of Commerce 2001). The vehicle count on Highway 2 in 2000 recorded 4,085 vehicles per day between the western Kalispell city limits and Route 424; only 1,657 vehicles per day are recorded from there to Marion (Montana Department of Transportation 1999).

Table 9. Employment by industry for Flathead County, Montana, 2000

<i>Total Full-time and Part-time Employment</i>	49,466		
<i>Farm Employment</i>	1,052		
<i>Nonfarm Employment</i>	48,414		
	<i>Private employment</i>	43,728	
	Services		15,754
	Retail trade		9,929
	Manufacturing		5,111
	Construction		4,206
	Finance, insurance, real estate		3,849
	Transportation, public utilities		2,228
	Agricultural services, forestry, fishing, other		1,228
	Wholesale trade		1,196
	Mining		227
	<i>Government</i>	4,686	
	Local		2,898
	Federal civilian		848
	State		551
	Military		389

Nonresident travel numbers grew during 1991–1999, with a 7.6 percent increase in use of the Kalispell airport and a 63 percent increase at the Canadian border port of Roosevelt; the average of all Montana/Canada border ports was a 9.2 percent increase (Montana Department of Transportation 1999).

PUBLIC USE

Up until establishment of Lost Trail as a national wildlife refuge, access to the property was through permission of owners and lessees only. Since a county road bisects the refuge (Pleasant Valley Road), visitors traveling through the area could observe and photograph wildlife visible from the roadway. With the open nature of the valley bottom, these roads provide nice wildlife observation opportunities, especially in the winter when the elk are feeding in the bottoms. Also visible are moose and eagles. The North 1019 road provides access through the refuge and PCTC lands to USDA Forest Service lands, allowing entry to areas that are open to public use.

According to the acquisition decision document for Lost Trail, the refuge was closed to consumptive recreational uses (i.e., hunting and fishing) pending development of plans. Other public uses were permitted as specified in the decision document that serves as the interim CCP. This includes wildlife observation and photography, environmental education, and interpretation. After establishment of the refuge in 1999, areas away from the road became accessible to the public by foot, cross-country skis, and snowshoes. This has provided more wildlife observation and photographic opportunities.

Since homesteaders established themselves in the Pleasant Valley starting in the late 1880s, most of the valley bottoms have been in private ownership. Land use mainly includes cattle ranching and associated activities such as haying. Public recreational use is by landowner permission only. The majority of the valley, including the refuge, is in close proximity to lands owned by the PCTC, DNRC, and USDA Forest Service, all of which are open to the public.

The PCTC has a block management agreement with the MFWP. Within MFWP's region 1 (includes the refuge), 800,000 acres of private land are in the block management program, of which PCTC owns 99 percent (MFWP 2002). Under the agreement, the public has access to these lands for recreation. Most PCTC roads are closed to motorized use but are open for other means of travel such as cross-country skiing, mountain biking, hiking, and horseback riding. For safety reasons, restrictions exist around areas being logged, but the public can use other areas for wildlife observation, hunting, photography, and general outdoor recreation.

The DNRC lands are also open for public use, under state regulations. Users having a current State Lands permit in their possession may hunt, hike, cross-country ski, and watch wildlife on these lands. The closest USDA Forest Service lands, administered by the Flathead, Lolo, and Kootenai national forests, also allow extensive public use and access, including downhill skiing, camping, fishing, hunting, river floating, hiking, and wilderness recreation (USDA Forest Service 2002).

Future visitation is hard to predict for the refuge, especially since there is little public use trend data from the past. With a large and fast-growing area just an hour away, the refuge has potential to attract visitors who are looking for a quiet, remote area to enjoy wildlife.

Hunting

Lost Trail is a remote refuge, nestled in a beautiful Intermountain valley—providing uncrowded hunting conditions and potential for quality hunting experiences.

In 2001, the refuge provided some hunter access across refuge lands to reach PCTC lands, allowing hunting under the MFWP block management plan. This included foot access along Bleise and Orr roads in the northern section, and along the South Pleasant Valley and Lund roads in the southern part of the refuge (map in appendix F). The refuge was closed to hunting, awaiting the completion of an EA for hunting and a hunt plan (with a compatibility determination and associated documentation).

A draft hunt plan was developed for the refuge in 2001. One of the issues raised is the need to provide opportunities for waterfowl hunting on the refuge. Waterfowl hunting is not permitted at this time due to the low numbers of ducks and geese using the refuge during the hunting season. The EA for the hunt plan noted that waterfowl populations and habitats would be evaluated in the future to determine the potential for hunting opportunities.

On completion of the EA and final hunt plan in 2002, some areas of the refuge were opened to deer, elk, mountain grouse, and turkey hunting. In addition to offering opportunities on the refuge, this allowed increased access to PCTC and DNRC lands that directly border the refuge (map in appendix F). A guide to authorized public uses was developed to ensure the safe operation of a quality hunt program and to facilitate public access on the refuge for the remainder of the year.

The biggest restriction to providing a quality hunt is the limited number of refuge staff available. Much needs to be done to provide information to hunters, not the least being a clear and understandable handout with a map, rules, and regulations. Signing along the refuge boundaries and closed areas is also important for proper use of the area during hunting season and to impart messages of conservation and ethical behavior.

Table 10 gives an idea of use during fall 2002, the first year the refuge was open for hunting. The weather during the majority of the 2002 hunting season, while cold, was relatively snow-free. Animals taken on the refuge included two white-tailed deer bucks and three cow elk.

Table 10. Use of Lost Trail National Wildlife Refuge (Montana) during the first hunting season

<i>Type of Hunting Opportunity</i>	<i>Estimated Numbers for 2002</i>
Deer and elk—youth-only archery	2
Deer and elk—archery	25
Deer and elk—youth-only rifle	20
Deer and elk—rifle	100
Hunters with disabilities, special access	11

[33 information requests]

The MFWP reported that 12,000 hunters spent 60,000 hunter days on block management areas in region 1 in 2000 (MFWP 2002). The popularity of this region is shown in the number of people applying for special elk permits in hunting district 103 (which includes the refuge)—for the 50 permits allowed, 337 Montana residents listed this area as their first choice (MFWP 2002).

Use of the refuge by elk during hunting season depends greatly on weather conditions, with warm weather and low snow keeping them in high areas and cold temperatures and deep snow driving them to valley bottoms. With access available to reach nearby PCTC, DNRC, and USDA Forest Service lands, the public has a large hunting area even if the animals are not using the refuge at that time.

Hunting success and regulations are directly related to prey populations. One of the greatest concerns the public has with wolf reintroduction is the effect that wolves would have on deer, elk, and moose populations. The hunting public has made substantial financial investments and sacrifices to restore ungulate populations to Montana (Sime 2002).

Fishing

At this time, there are no viable sport fishing opportunities, due in large part to past land practices that changed the hydrology of Dahl Lake, Pleasant Valley Creek, and the watershed downstream. The lake and creeks on the refuge were modified to provide for irrigation of grass and hayfields and no longer support a large native fishery.

Fishing is not allowed on the refuge, due in part to the lack of a viable fishery and to an ongoing wetland restoration program. Fishing is enjoyed by the public in areas around Marion (Bitterroot Lake), Kalispell (Flathead River, Smith Lake), and near Libby (Lake Kococanusa, Thompson and Fisher rivers).

Wildlife Observation and Photography

Visitors to the refuge enjoy wildlife observation and photography experiences mainly during spring months, when deer, elk, and other wildlife are more readily observable and roads are open. Waterfowl enthusiasts observe and photograph waterfowl throughout spring, summer, and fall at the various wetlands and ponds. It is unknown how many visitors visit the refuge to enjoy these activities.

Interpretation

Interpretive materials and displays are extremely limited at this time—one public use handout (appendix F) and a few signs.

For many visitors, taking part in interpretive activities is their primary contact with refuge staff, and could be their first contact with the refuge, conservation, and wildlife.

Environmental Education

The idea behind environmental education is to change the way people behave in everyday life. The Environmental Protection Agency defines environmental education (EPA 1996) as:

- a learning process that increases people’s knowledge and awareness about the environment and associated challenges
- develops the necessary skills and expertise to address these challenges
- fosters attitudes, motivations, and commitments to make informed decisions and take responsible actions

Due to its diversity of habitat and wildlife species, the refuge has the potential for providing quality outdoor experiences in environmental education. The refuge has, within its boundaries, a piece of the Intermontane ecosystem—the type usually used for farming, ranching, or home sites and that is fast disappearing. It offers a unique opportunity for students to learn about and interact with plants and animals that naturally occur in the area.

Even with limited facilities and staff, the refuge has conducted a number of environmental education activities, especially involving the local schools of Pleasant Valley, Marion, and the Montana Academy. Along with in-school programs, students have been involved with building and erecting bluebird and goose nest structures, water monitoring, and amphibian surveys.

In addition, programs involving volunteer groups are ongoing, including fence removal with the RMEF, bird surveys with the Flathead Chapter of the Audubon Society, and general projects with the MCC and Landmark Volunteers.

The Service has educational curriculum, videos, and distance-learning opportunities that can be available

free to educators. The refuge currently is (and will continue) gathering information on natural and cultural resources specific to the refuge for management, which can be made available for educational purposes.

Research into the need for and use of an education program needs to be evaluated. There is no history to show that educational resources would be used. The refuge would need to avoid duplicating what is already being offered in the areas in and around Kalispell to attract participants to this remote area and not waste time and money.

ADMINISTRATIVE SETTING

The majority of the refuge is adjacent to forestlands owned by the PCTC. Private ranching tracts lie to the west and southwest.

State lease lands encompass approximately 1,440 acres within the refuge boundary (figure 11). Leases for these lands may be transferred to the Service as renewals arise.

Opportunity exists for coordinated resource management with PCTC and the DNRC—cooperation could provide for mutually beneficial management of resources, public access, and associated recreational use.

HABITAT PROTECTION

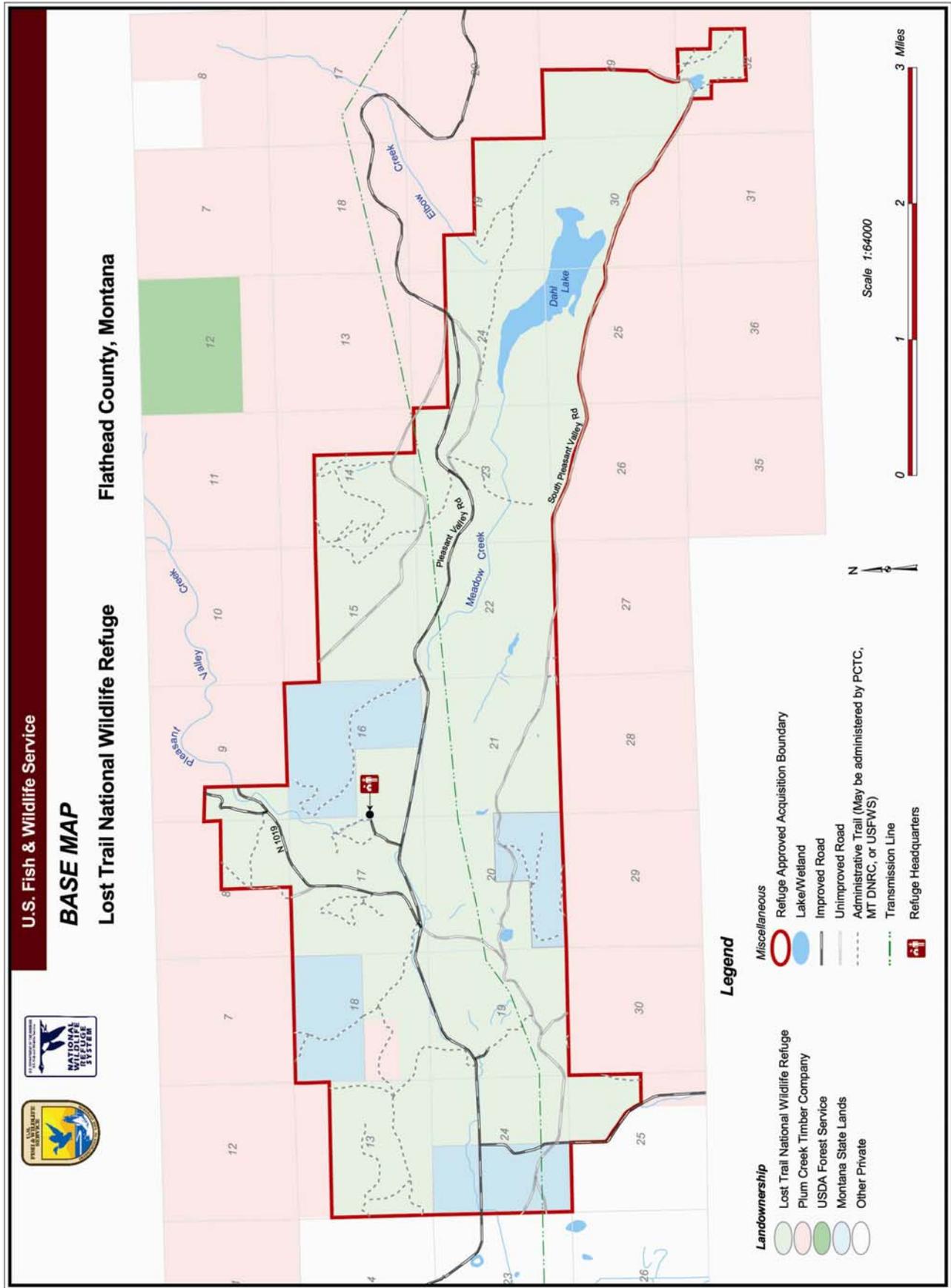
Farming and ranching in Montana maintains open space. That open space is also habitat for a diversity of wildlife species. Maintaining the land base for agriculture and wildlife habitat is an increasing challenge, given broader trends in resource and agricultural economics, human population demographics, and development of the “New West” (Sime 2002).

Pleasant Valley is located in a prime subdivision area with abundant wildlife, many lakes, and beautiful scenery and is within easy commuting distance of Kalispell, Montana.

Increasing settlement during the last century has significantly transformed the valley floors of northwest Montana. Large undeveloped tracts of agricultural lands and a complex of wildlands, wetlands, rivers, grassland, and forests are being converted to home sites.

Lack of planning and effective zoning has led to a highly fragmented residential development pattern. In 1999, 46 percent of new residential development in Flathead County occurred in rural areas.

Conservation efforts have been initiated in the area surrounding the refuge. The NRCS has purchased conservation easements from willing landowners in the Pleasant Valley area. The largest private landowner in the area, PCTC, signed a conservation



easement with MFWP on 142,000 acres in the Fisher and Thompson river drainages. PCTC is currently selling land surrounding Island Lake (just west of the refuge).

The refuge is, with the exception of PCTC lands, the largest single, contiguous land parcel in the Pleasant Valley area. Much of the private land in the valley is under the ownership of large family-owned ranches. Two of the ranches neighboring the refuge have placed NRCS WRP easements on portions of their properties.

To achieve Service goals for fish, wildlife, and habitats, as well as allowing compatible public uses, the Service will pursue acquisition or protection of inholdings within the refuge boundary (figure 11) when land is available and as funding permits. The following areas are identified as inholdings (figure 11):

- Four state school trust land parcels totaling 1,440 acres. [State law requires the DNRC to manage these lands in a manner that produces revenue to help support the state's public schools. Management activities include grazing, haying, and timber harvest where applicable; one of the state parcels has been lease-transferred to the Service, two of the remaining three state parcels will be lease-transferred to the Service upon expiration of the present lease.]
- One forested inholding owned by PCTC of 80 acres.

Acquisition of additional habitat outside the executive boundary is not needed at this time. The Service recognizes that lands surrounding the refuge have the potential to provide increased, secure habitat for the protection of many wildlife species. Protection of these lands would maintain and promote the long-term viability of wildlife in the Pleasant Valley ecosystem as well as preserve the integrity of the refuge. For this reason, habitat protection measures via future conservation easements will be evaluated.

FACILITIES

Most structures and facilities obtained with the acquisition of the refuge were previously used in ranching activities (appendix G). Many of these facilities are in excess to Service needs and are occupying areas that potentially could be restored to grassland habitat. Some facilities are detrimental to the refuge because they:

- are wildlife hazards;
- harbor predators of ground-nesting birds;
- increase maintenance costs;
- increase fixed costs;
- detract from the natural appearance of the landscape.

Four residences exist on the refuge in addition to a large indoor arena that has a four-bedroom apartment. Two log buildings are used as office and storage space. An abandoned cattle station includes an office, numerous holding stalls and pens, small wooden corrals, and a calving barn.

In 2002, the office section of the horse arena was remodeled into a new headquarters complex (appendix F). The new headquarters provides office space for minimum staffing levels when positions are funded. It is also being made accessible and will provide restroom facilities during public hours. There are few nearby services to the refuge and no nearby public eating or restroom facilities.

The infrastructure for all these buildings includes three wells supplying potable water to the residences, five operational septic systems, three storage buildings, two shop areas (only one currently used), and two horse barns with stalls.

There are several culverts and cattle guards on 27 miles of interior and boundary roads (grass-covered and graveled). Pleasant Valley Road, a county-maintained road, traverses east-to-west through the refuge. The public roads accessing the refuge sometimes get blocked during winter storms. Approximately 30 miles of five-strand, barbwire boundary and interior fence exists.

OPERATIONS

Since its establishment in August of 1999, Lost Trail has been managed as a satellite refuge of the National Bison Range complex, located near Moiese, Montana. One full-time, permanent refuge manager (supervisory refuge operations specialist, grade GS-11) staffs the refuge.

Other staff includes a refuge manager trainee (grade GS-5) who was assigned to the refuge from May 2000 to June 2001. One seasonal biological technician (grade GS-4) worked on the refuge during the summers of 1999–2001. Two seasonal volunteers were stationed at the refuge during the summer of 2000. During the summer of 2001, one volunteer assisted with various ongoing refuge programs.

Visitors have limited opportunities to contact staff and receive information about public use opportunities. With limited staffing, the office is not usually available to the public 40 hours per week. There are public use handouts (i.e., tear sheets) at headquarters, as well as at kiosks located in the main parking areas (appendix F).

The negotiations between the CSKT Government and the Service concerning an annual funding agreement with the National Bison Range complex resulted in staffing changes at the complex and, consequently, at the refuge. As a result, two new

positions—one full-time permanent and one career-seasonal—were funded at the refuge. It is unknown what effects the agreement will have on the level of involvement and support that National Bison Range personnel will be able to provide to the refuge.

PARTNERSHIPS

Even though the refuge has been in existence a short time, several partnerships have been established.

- MFWP have provided firm support for refuge establishment, wildlife data (especially for big game animals), and hunting regulation enforcement. The MFWP is an active participant in the planning process.
- Flathead and Lincoln counties provide logistical support and funding for invasive plant management.
- Roads and utilities are maintained by a cooperative relationship with the county road and bridge department.
- A good working relationship exists with PCTC (figure 11) in the shared management of roads, fences, and invasive plants.
- A good-neighbor policy exists with McGinnis Meadows Guest Ranch to help maintain refuge fences for the benefit of wildlife and neighboring cattle.

- The USDA Forest Service and DNRC cooperate with the refuge for fire and invasive plant management.
- A close working relationship exists with NRCS to manage lands under the wetland restoration program.
- RMEF is generously providing funding for a variety of refuge projects to benefit wildlife, such as fence removal and invasive plant management.
- The refuge staff works closely with local schools (Pleasant Valley School and Montana Academy), Flathead Audubon, and MCC to provide educational activities that benefit the refuge resources by providing management information.

The refuge has had multiple entities requesting information about the restoration effort on Pleasant Valley Creek. Many of these potential partners have offered either to provide funding or expertise, as well as help to find additional funding sources. Restoration is always expensive. Refuge staff are working with these groups and coordinating with NRCS regarding funding needs to produce a restoration effort that will contribute a quality conservation effort of riparian habitat, migratory birds, and native fish.

4 Alternatives



Dahl Lake is nestled in the Pleasant Valley.

The challenge for natural resource managers is to find ways to address the sometimes-conflicting goals for various aspects and levels of resource management and protection. For Lost Trail National Wildlife Refuge, restoration of historical, well-functioning stream systems and native vegetation were key factors driving development of management alternatives.

Each alternative for the Lost Trail National Wildlife Refuge's CCP has been designed to meet refuge goals through a unique set of objectives, levels of management, and timeframes—that form options for addressing ecosystem and resource needs and public use.

Four alternatives for management of the refuge were considered. The proposed action (alternative A) describes the draft CCP for the refuge. Current management is described in the no-action alternative (D).

This chapter describes alternative management options and includes the following sections.

- Summary of alternatives
 - management emphases
 - summarized objectives
 - eliminated alternatives
- Descriptions of alternatives
 - detailed objectives
 - strategies to carry out objectives
- Funding and staffing

The rationales for objectives and strategies are described in appendix H. The rationales describe the background, assumptions, and technical details so that the reader can understand how and why objectives and strategies were formulated. Reference is made to the applicable rationale(s) within the major topics in each alternative.

Note: Most measurements in the objectives are in United States measures. However, for meaning in

the scientific community, some measurements are displayed in the metric system. The conversion table below will help readers who wish to understand values in United States measures.

Table 11. Measurement unit conversions

<i>Metric Measure</i>	<i>United States Measure</i>
1 millimeter (mm)	= 0.04 inch
1 centimeter (cm)	= 0.4 inch
1 decimeter (dm)	= 3.94 inches
1 meter (m)	= 39.4 inches
1 square centimeter	= 0.16 square inch

SUMMARY OF ALTERNATIVES

All alternatives have been designed to meet the refuge vision and goals, through a variety of themes for habitats, wildlife, and public use. The focus and level of management in each alternative are described in table 12 and are further reflected in alternative-specific objectives developed to meet the refuge goals (chapter 1).

- A goal is a descriptive, broad statement of desired future conditions that conveys a purpose, but does not define measurable units. [*Each alternative addresses all goals for the refuge.*]
- An objective is a concise statement of what we want to achieve, how much we want to achieve, when and where we want to achieve it, and who is responsible to achieve it. [*Complete objectives are included in the descriptions of alternatives.*]
- A strategy is a specific action, tool, or technique used to meet objectives. The strategies include restoration and development activities, monitoring, plans, partnerships, operations, and more. [*Strategies are listed after the objectives for each topic.*]

Table 12. Management emphases for alternatives for the CCP, Lost Trail National Wildlife Refuge, Montana

<i>Alternative A (proposed action)</i>	<i>Alternative B</i>	<i>Alternative C</i>	<i>Alternative D (no action)</i>
— The biological potential of native plants and wildlife is provided through restored and enhanced habitats.	— Manipulated habitats maximize use by huntable and watchable birds and mammals, and sport fisheries.	— Habitats are restored. Natural ecological processes drive habitat functions and wildlife populations.	— Habitats are protected from further detrimental change.
— Use by an informed public does not impede reaching the biological potential.	— Maximum, compatible public use occurs.	— Public use is limited, with wildlife observation, photography, and interpretation occurring along roads and trails. Informed visitors do not disturb plants or wildlife.	— Minimum public use occurs.
— Staffing is minimal, and facilities are improved.	— Staffing is minimal, with additional law enforcement. Visitors have quality experiences at developed facilities	— Staffing is minimal, and facilities are improved.	— Minimal staff conduct custodial-level maintenance.
— Partnerships accomplish habitat management and foster conservation.	— Partnerships accomplish habitat management and foster conservation.	— Partnerships accomplish restoration.	— Partnerships accomplish basic needs.

Table 13 displays the refuge goals and summarizes each alternative and its objectives. [A grayed box indicates where there is no corresponding objective for the topic area within an alternative.]

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

<i>Riparian Habitat Goal</i>	<i>Restore, enhance, and maintain a mixed deciduous and coniferous riparian habitat to support indigenous wildlife species and perpetuate the ecological integrity of the Fisher River watershed.</i>		
<i>Objectives for Alternative A (proposed action)</i>	<i>Objectives for Alternative B</i>	<i>Objectives for Alternative C</i>	<i>Objectives for Alternative D (no action)</i>
—Biological potential emphasis —Compatible public use opportunities	—Habitat and species protection —Maximum compatible, public use opportunities	—Habitat restoration and natural processes —Minimum public use opportunities	—Custodial management —Limited public use opportunities
■ The Service will maintain coordination and collaboration for restoration of the stream vegetation and stream meander on the WRP easement to the south end of Pleasant Valley Creek, and Meadow Creek after it flows west from the water control structure until it joins with Pleasant Valley Creek, by meeting with the NRCS annually.	<i>same as alternative A</i> 		

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

Riparian Habitat Goal

Restore, enhance, and maintain a mixed deciduous and coniferous riparian habitat to support indigenous wildlife species and perpetuate the ecological integrity of the Fisher River watershed.

<p><i>Objectives for Alternative A</i> (proposed action)</p> <ul style="list-style-type: none"> –Biological potential emphasis –Compatible public use opportunities 	<p><i>Objectives for Alternative B</i></p> <ul style="list-style-type: none"> –Habitat and species protection –Maximum compatible, public use opportunities 	<p><i>Objectives for Alternative C</i></p> <ul style="list-style-type: none"> –Habitat restoration and natural processes –Minimum public use opportunities 	<p><i>Objectives for Alternative D</i> (no action)</p> <ul style="list-style-type: none"> –Custodial management –Limited public use opportunities
<ul style="list-style-type: none"> ■ Inventory and evaluate willow, alder, and birch vegetation (20 acres) in the Dahl Lake wetlands within 5 years of CCP approval, to determine the potential to increase plant diversity and habitat for migratory songbirds. 	<p><i>same as alternative A</i></p> <p>.....→</p>		
<ul style="list-style-type: none"> ■ Restore streambank vegetation (willow, alder, hawthorn) within a 20-foot buffer with 75 percent canopy cover, along 0.9 mile of Pleasant Valley Creek (north of breached water control structure) within 5 years of CCP approval, to enhance nesting and foraging materials for migratory birds, and reduce water temperature for fish and amphibians. 	<p><i>same as alternative A</i></p> <p>.....→</p>		
<ul style="list-style-type: none"> ■ Evaluate three ponds, three water control structures, and three culverts along Pleasant Valley Creek within 5 years of CCP approval, to determine effects on stream quality (siltation and temperature) and downstream fisheries. 			
<ul style="list-style-type: none"> ■ Enhance the integrity of the Pleasant Valley Creek restoration project by working with NRCS; MFWP; and private landowners to make the full length of Pleasant Valley Creek on and off the refuge fish passage-friendly within 8 years of CCP approval. 	<p><i>same as alternative A</i></p> <p>.....→</p>		

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

Riparian Habitat Goal *Restore, enhance, and maintain a mixed deciduous and coniferous riparian habitat to support indigenous wildlife species and perpetuate the ecological integrity of the Fisher River watershed.*

<p><i>Objectives for Alternative A</i> (proposed action)</p> <ul style="list-style-type: none"> -Biological potential emphasis -Compatible public use opportunities 	<p><i>Objectives for Alternative B</i></p> <ul style="list-style-type: none"> -Habitat and species protection -Maximum compatible, public use opportunities 	<p><i>Objectives for Alternative C</i></p> <ul style="list-style-type: none"> -Habitat restoration and natural processes -Minimum public use opportunities 	<p><i>Objectives for Alternative D</i> (no action)</p> <ul style="list-style-type: none"> -Custodial management -Limited public use opportunities
<ul style="list-style-type: none"> ■ Maintain, and increase when feasible, quaking aspen acreage on the refuge in the Dahl Lake wetland complex [currently unit 12 (3 acres), unit 14 (23 acres), and unit 19 (24 acres)]. 	<p><i>same as alternative A</i> →</p>		
	<ul style="list-style-type: none"> ■ Evaluate feasibility, within 2 years of CCP approval, of restoration of Pleasant Valley Creek to a level that can sustain catch-and-release native trout fisheries, to restore native redband and westslope cutthroat trout fisheries and increase fishing opportunities. 	<ul style="list-style-type: none"> ■ Restore Pleasant Valley Creek to its natural form and function within 1 year of CCP approval, with a corridor of native vegetation, to decrease water temperatures and reduce siltation. 	
		<ul style="list-style-type: none"> ■ Restore diverse, naturally occurring riparian plant communities while maintaining a minimum of the current acreage of aspen (70 acres), willow (13 acres), and birch and alder (6 acres), within 5 years of CCP approval, to increase vegetative diversity and stabilize soil. 	

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

<p>Wetland Habitat Goal <i>Provide breeding, resting, and feeding habitat for wetland-dependent species of northwestern Montana by restoring, maintaining, and enhancing a mosaic of lake, semipermanent, seasonal, temporary, and saturated wetlands.</i></p>			
<p><i>Objectives for Alternative A</i> (proposed action) –Biological potential emphasis –Compatible public use opportunities</p>	<p><i>Objectives for Alternative B</i> –Habitat and species protection –Maximum compatible, public use opportunities</p>	<p><i>Objectives for Alternative C</i> –Habitat restoration and natural processes –Minimum public use opportunities</p>	<p><i>Objectives for Alternative D</i> (no action) –Custodial management –Limited public use opportunities</p>
<p>■ Recharge 100 percent of drained wetlands to 75–100 percent capacity within 5 years of CCP approval, to foster wetland recharge and promote wetland revegetation for wildlife habitat.</p>	<p>..... <i>same as alternative A</i>.....→</p>	<p>■ Restore drained wetlands, remove all structures, and allow drained wetlands to recharge and function with naturally occurring seasonal fluctuations and not hinder subsequent levels of emergent vegetation, within 7 years of CCP approval, to provide invertebrate foods and emergent vegetation for foraging habitat and nesting and brood cover.</p>	<p>■ Recharge one-third of drained wetlands to 75–100 percent capacity within 1 year of CCP approval, to foster wetland recharge, promote revegetation around wetlands, and provide waterfowl habitat.</p>
<p>■ Maintain wetland basins, other than the Dahl Lake complex, with a minimum 50:50 water-to-cover ratio well interspersed, within 5–10 years of CCP approval, to provide foraging and nesting habitat for water birds.</p>			<p>..... <i>same as alternative A</i>.....→</p>
<p>■ Restore Dahl Lake complex water levels to gain a minimum of 200 acres of temporary wetlands, and restore temporary wetlands (80 acres) to seasonal and semipermanent wetlands that fluctuate naturally, within 5 years of CCP approval, to provide water bird foraging and nesting habitat.</p>	<p>..... <i>same as alternative A</i>.....→</p>		<p>..... <i>same as alternative A</i>.....→</p>
<p>■ Increase ground-nesting habitat with construction of up to five nesting islands on Dahl Lake within 11 years of CCP approval, if soil plasticity is suitable for proper construction, to increase wildlife habitat.</p>	<p>..... <i>same as alternative A</i>.....→</p>		<p>..... <i>same as alternative A</i>.....→</p>

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

Wetland Habitat Goal

Provide breeding, resting, and feeding habitat for wetland-dependent species of northwestern Montana by restoring, maintaining, and enhancing a mosaic of lake, semipermanent, seasonal, temporary, and saturated wetlands.

<p><i>Objectives for Alternative A</i> (proposed action) –Biological potential emphasis –Compatible public use opportunities</p>	<p><i>Objectives for Alternative B</i> –Habitat and species protection –Maximum compatible, public use opportunities</p>	<p><i>Objectives for Alternative C</i> –Habitat restoration and natural processes –Minimum public use opportunities</p>	<p><i>Objectives for Alternative D</i> (no action) –Custodial management –Limited public use opportunities</p>
<p>■ Conduct a wetland study in the Dahl Lake complex to determine how montane wetlands function as recharge and discharge basins within 6 years of CCP approval, to determine effects on vegetative, invertebrate, and wildlife associations.</p>	<p><i>same as alternative A</i> →</p>		
<p>■ Restore natural wetland vegetation in Dahl Lake wetland complex by reducing reed canarygrass by 40–80 percent within 10 years of CCP approved, to allow the reestablishment of sedge, rush, mint, pondweed, cattail, and bulrush as the dominant plant species.</p>	<p>■ Convert reed canarygrass by 40–80 percent in the Dahl Lake wetland complex by planting wild rice within 10 years of CCP approval, to increase forage for migratory waterfowl.</p>	<p><i>same as alternative A</i> →</p>	
<p>■ Inventory for fens (alkaline bogs) within 1 year of CCP approval, to protect from invasive plants.</p>	<p><i>same as alternative A</i> →</p>		
	<p>■ Maximize water manipulation capabilities in wetland basins by installing two or three water control structures within 7 years of CCP approval, to increase diverse emergent vegetation and seed-producing annuals interspersed with open water for increased foraging habitat and brood cover for migratory waterfowl.</p>		

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

<p>Wetland Habitat Goal <i>Provide breeding, resting, and feeding habitat for wetland-dependent species of northwestern Montana by restoring, maintaining, and enhancing a mosaic of lake, semipermanent, seasonal, temporary, and saturated wetlands.</i></p>			
<p><i>Objectives for Alternative A</i> (proposed action) –Biological potential emphasis –Compatible public use opportunities</p>	<p><i>Objectives for Alternative B</i> –Habitat and species protection –Maximum compatible, public use opportunities</p>	<p><i>Objectives for Alternative C</i> –Habitat restoration and natural processes –Minimum public use opportunities</p>	<p><i>Objectives for Alternative D</i> (no action) –Custodial management –Limited public use opportunities</p>
	<ul style="list-style-type: none"> ■ Evaluate the feasibility of restoring Lower Moose pond’s breached dam on Pleasant Valley Creek within 6 years of CCP approval, to determine potential for maintaining a permanent wetland for nesting waterfowl, wildlife observation, and photography. 		
<p>Grassland Habitat Goal <i>Restore, enhance, and maintain Intermountain grasslands, with an emphasis on native bunchgrass prairie to provide habitat for migratory birds, species of concern, and associated wildlife species.</i></p>			
<ul style="list-style-type: none"> ■ Fence and post the entire refuge boundary within 3 years of CCP approval, to make clear to the public when they have entered or exited the refuge, and to prohibit unauthorized livestock grazing. 	<p><i>same as alternative A</i></p> <p>-----></p>		
<ul style="list-style-type: none"> ■ Develop soil descriptions for the entire refuge within 1 year of CCP approval (coordinate with NRCS), for a baseline understanding of soils to help with future management considerations. 	<p><i>same as alternative A</i></p> <p>-----></p>		

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

<i>Restore, enhance, and maintain Intermountain grasslands, with an emphasis on native bunchgrass prairie to provide habitat for migratory birds, species of concern, and associated wildlife species.</i>			
Grassland Habitat Goal			
<i>Objectives for Alternative A</i> (proposed action) –Biological potential emphasis –Compatible public use opportunities	<i>Objectives for Alternative B</i> –Habitat and species protection –Maximum compatible, public use opportunities	<i>Objectives for Alternative C</i> –Habitat restoration and natural processes –Minimum public use opportunities	<i>Objectives for Alternative D</i> (no action) –Custodial management –Limited public use opportunities
<ul style="list-style-type: none"> ■ Maintain native grasslands (1,450 acres) not closely associated with wetlands (north of Pleasant Valley Road), for a healthy Palouse prairie grassland dominated by Idaho and rough fescues, and western wheatgrass (Idaho fescue with average 8–12 flower stalks/plant, 20–22 cm in maximum leaf length per plant, 14–17 sq. cm live basal area, and average 12.7–22.9 cm leaf height; and rough fescue with an average 25–30 cm leaf height), to provide a vigorous plant community for ground-nesting migratory birds and forage for other wildlife. 	<ul style="list-style-type: none"> ■ Map and use adaptive management to maintain native bunchgrass prairie (dominated by 50–80 percent Idaho or rough fescue and western wheatgrass, with 5–10 percent forbs, and 0–5 percent shrubs) on 1,200 acres of uplands in management units 6 and 22, within 10 years of CCP approval, to provide habitat for migratory birds and winter range for elk and deer. 	<ul style="list-style-type: none"> ■ Maintain native, upland grasslands (1,500 acres) with dominant grass species of Idaho and rough fescue and western wheatgrass, within 10 years of CCP approval, in appropriate composition percentages dependent on soil types (vigorous Idaho fescue with an average of 8–12 flower stalks/plant, 7.9–8.7” maximum leaf length/plant, and 2.2–2.7 sq. inches live basal area and average 5–9” leaf height; and rough fescue with average 9.8–11.8” leaf height), to restore and maintain vigorous bunchgrass uplands for nesting migratory birds and forage for other wildlife. 	<ul style="list-style-type: none"> ■ Restore vigor to grasslands within 5 years of CCP approval, with rest from use of any management tool until reaching a minimum of 0.6” litter depth and a minimum 7.9” visual obstruction reading (VOR) in areas of tame grasses (Idaho fescue has an average of 8–12 flower stalks/plant, 7.9–8.87” maximum leaf length/plant, 2.2–2.7 sq. inches live basal area, and an average 5–9” leaf height; and rough fescue has an average 9.8–11.8” leaf height), to increase cover for nesting migratory birds and provide forage for other wildlife.
<ul style="list-style-type: none"> ■ Monitor, every 2 years, 336 acres of western wheatgrass in management units 13 and 14, and 45 acres of Kentucky bluegrass in management unit 19, and maintain as medium-tall, dense grasslands with litter depth of 15–30 mm and 1.5–2 dm VOR to provide habitat for nesting blue-winged and cinnamon teal. 	<p><i>same as alternative A</i> →</p>		

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

<i>Grassland Habitat Goal</i>			
<i>Restore, enhance, and maintain Intermountain grasslands, with an emphasis on native bunchgrass prairie to provide habitat for migratory birds, species of concern, and associated wildlife species.</i>			
<i>Objectives for Alternative A</i> (proposed action) –Biological potential emphasis –Compatible public use opportunities	<i>Objectives for Alternative B</i> –Habitat and species protection –Maximum compatible, public use opportunities	<i>Objectives for Alternative C</i> –Habitat restoration and natural processes –Minimum public use opportunities	<i>Objectives for Alternative D</i> (no action) –Custodial management –Limited public use opportunities
<ul style="list-style-type: none"> ■ Monitor, every 2 years, 190 acres of Idaho fescue and western wheatgrass in upland grasslands around the Dahl Lake wetland complex (management unit 11), and maintain as tall, dense grasslands with litter depth of 15–30 mm and 3 dm VOR, to provide nesting habitat for mallard, gadwall, and lesser scaup. 	<ul style="list-style-type: none"> ■ Inventory and use adaptive management to maintain 330 acres of Idaho fescue and western wheatgrass in upland grasslands around the Dahl Lake wetland complex (management units 11 and 12) as tall, dense grasslands with litter depth 0.6–1.2” and 11.8” VOR, starting within 5 years of CCP approval, to provide nesting habitat for mallard, gadwall, and lesser scaup. 		
<ul style="list-style-type: none"> ■ Monitor 900 acres dominated by Idaho fescue and rough fescue (management units 8–10, 12, 15, and 20) every 2 years; for Idaho fescue with an average 8–12 flower stalks per plant, 20–22 cm maximum leaf length per plant, 14–17 sq. cm live basal area, and an average 12.7–22.9 cm leaf height; to determine when management action is needed to maintain vigorous plant communities for ground-nesting migratory birds and forage for other wildlife. 	<ul style="list-style-type: none"> ■ Monitor 770 acres dominated by Idaho fescue in management units 8–10, 15, and 20, starting within 5 years of CCP approval; for Idaho fescue—average 8–12 flower stalks/plant, 7.9–8.7” maximum leaf length/plant, 2.2–2.7 sq. inches live basal area, and 5–9” leaf height, to determine when management action is needed to maintain vigorous plant communities for ground-nesting migratory birds and forage for other wildlife. 	<ul style="list-style-type: none"> ■ Evaluate grassland communities to determine ecological trend and similarity to climax community, in management units 10–15, 19, and 20, and define needs and opportunities in a habitat management plan developed within 2 years of CCP approval. 	<ul style="list-style-type: none"> ■ Examine the biological potential of climax vegetative communities for grasslands of the uplands and bottomlands, and develop a habitat management plan that gives high priority to migratory bird habitat, within 2 years of CCP approval, to enhance biological integrity.
<i>Forest Habitat Goal</i>			
<i>Enhance and maintain Douglas-fir, ponderosa pine, aspen, and cottonwood forested habitats within the context of the Fisher River watershed for migratory birds, species of concern, and other associated wildlife species.</i>			
<ul style="list-style-type: none"> ■ Identify forest coverage types within 1 year of CCP approval, to ensure management activities do not hinder the biological potential of forest habitats. 	<p style="text-align: center;"><i>same as alternative A</i></p>		

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

Forest Habitat Goal *Enhance and maintain Douglas-fir, ponderosa pine, aspen, and cottonwood forested habitats within the context of the Fisher River watershed for migratory birds, species of concern, and other associated wildlife species.*

<p><i>Objectives for Alternative A</i> (proposed action) –Biological potential emphasis –Compatible public use opportunities</p>	<p><i>Objectives for Alternative B</i> –Habitat and species protection –Maximum compatible, public use opportunities</p>	<p><i>Objectives for Alternative C</i> –Habitat restoration and natural processes –Minimum public use opportunities</p>	<p><i>Objectives for Alternative D</i> (no action) –Custodial management –Limited public use opportunities</p>
<ul style="list-style-type: none"> ■ Evaluate forest coverage, age, and density related to surrounding lands owned by PCTC and the USDA Forest Service within 4 years of CCP approval, to determine what habitat type is the least represented in the ecosystem that can be managed for on suitable refuge lands. 			
<ul style="list-style-type: none"> ■ For the duration of the CCP, maintain a ponderosa pine, mixed-conifer forest with widely spaced trees (20-foot spacing between pines), open grassy areas, and an understory of fescue or junegrass and snowberry or kinnikinnick, to conserve a major forest type that facilitates the biological integrity of the ecosystem. 	<ul style="list-style-type: none"> ■ Inventory and maintain a ponderosa pine, mixed-conifer forest with: (1) widely spaced trees (20-foot spacing between pines); (2) open grassy areas; (3) an understory of fescue or junegrass and snowberry or kinnikinnick; and (4) 20–30 percent of pole-sized stands to remain as cover; within 10 years of CCP approval, to provide foraging habitat and thermal cover for elk and deer. 	<ul style="list-style-type: none"> ■ Manage forest as a natural component of the ecosystem without manipulation, unless deemed necessary for human safety or to protect neighboring resources to maintain natural habitat for Canada lynx in the future. 	<ul style="list-style-type: none"> ■ Manage forest habitat with a “hands-off” policy, with the exception of wildland fire suppression, until a refuge manager and biologist are on-site to develop a management plan within 3 years after full staffing, to protect refuge and neighboring property.
	<ul style="list-style-type: none"> ■ Create nesting habitat for Merriam’s turkey by thinning 10 percent of pole-sized conifer stands and leaving the remaining tree slash on the ground (in forest on the west end of the refuge, remove Douglas-fir > 2 feet tall and up to 6” dbh, and ponderosa and lodgepole pine > 2 feet tall and up to 4” dbh), within 10 years of CCP approval, to maintain or increase the nonnative turkey population for hunting opportunities. 		

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

Forest Habitat Goal			
<i>Enhance and maintain Douglas-fir, ponderosa pine, aspen, and cottonwood forested habitats within the context of the Fisher River watershed for migratory birds, species of concern, and other associated wildlife species.</i>			
<i>Objectives for Alternative A</i> (proposed action) –Biological potential emphasis –Compatible public use opportunities	<i>Objectives for Alternative B</i> –Habitat and species protection –Maximum compatible, public use opportunities	<i>Objectives for Alternative C</i> –Habitat restoration and natural processes –Minimum public use opportunities	<i>Objectives for Alternative D</i> (no action) –Custodial management –Limited public use opportunities
		<ul style="list-style-type: none"> ■ Evaluate past use and historical fire regimes of forest types, and determine how fire can best be reintroduced to the ecosystem, within 5 years of CCP approval, to maintain a mosaic of open ponderosa pine with areas of Douglas-fir, lodgepole pine, larch, and spruce as defined by soil, slope, aspect, and moisture, to conserve forest and the biological integrity of the ecosystem. 	
Invasive Plant Goal			
<i>Native plant communities, composition, occurrence, and density exist without degradation by invasive plants, and support associated wildlife.</i>			
<i>Objectives for Alternative A</i> (proposed action) –Biological potential emphasis –Compatible public use opportunities	<i>Objectives for Alternative B</i> –Habitat and species protection –Maximum compatible, public use opportunities	<i>Objectives for Alternative C</i> –Habitat restoration and natural processes –Minimum public use opportunities	<i>Objectives for Alternative D</i> (no action) –Custodial management –Limited public use opportunities
<ul style="list-style-type: none"> ■ Develop and implement an invasive plant management plan within 1 year of CCP approval that identifies: (1) the extent of encroachment by spotted knapweed, tansy ragwort, and sulfur cinquefoil; (2) suitable control methods; and (3) monitoring needs; to document infestations and provide an index to effectiveness of management actions. 	<p style="text-align: center;"><i>same as alternative A</i></p> <p style="text-align: center;">-----></p>		
<ul style="list-style-type: none"> ■ Reduce spotted knapweed to a level of 25 percent or less of overall grassland area within 3 years of CCP approval, to maintain native vegetation for wildlife forage, cover, and nesting. 	<p style="text-align: center;"><i>same as alternative A</i></p> <p style="text-align: center;">-----></p>	<ul style="list-style-type: none"> ■ Reduce spotted knapweed and other invasive plants to a level of 10 percent or less of overall grassland area, within 3 years of CCP approval, to maintain native vegetation for wildlife forage, cover, and nesting. 	

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

<i>Invasive Plant Goal</i>	<i>Native plant communities, composition, occurrence, and density exist without degradation by invasive plants, and support associated wildlife.</i>		
<i>Objectives for Alternative A</i> (proposed action) –Biological potential emphasis –Compatible public use opportunities	<i>Objectives for Alternative B</i> –Habitat and species protection –Maximum compatible, public use opportunities	<i>Objectives for Alternative C</i> –Habitat restoration and natural processes –Minimum public use opportunities	<i>Objectives for Alternative D</i> (no action) –Custodial management –Limited public use opportunities
<ul style="list-style-type: none"> ■ Annually eradicate and maintain 75–90 percent control of tansy ragwort with an extensive survey and treatment effort coordinated with PCTC and the state coordinator for tansy ragwort, to maintain native vegetation for wildlife forage, cover, and nesting. 	<p><i>same as alternative A</i> →</p>		
<ul style="list-style-type: none"> ■ Annually conduct invasive plant control on 200–400 acres of upland grasslands for 15 years after CCP approval, to maintain native prairie composed of 90 percent native vegetation composition. 	<ul style="list-style-type: none"> ■ Conduct invasive plant control on 300–400 acres of upland grasslands each year for the next 15 years, to maintain native prairie composed of 90 percent native vegetation composition. 		<p><i>same as alternative A</i> →</p>
<ul style="list-style-type: none"> ■ Restore native grasses and sedges over 85 percent of the area where there is introduced creeping meadow foxtail, starting within 1 year of CCP approval, to increase plant diversity and provide wildlife habitat. 	<ul style="list-style-type: none"> ■ Determine the best method possible and begin restoration of 35 percent of the introduced creeping meadow foxtail in the bottomlands to native grass and sedges, within 1 year of CCP approval, while maintaining 25–40 percent of the foxtail tracts with a minimum of 0.6” litter depth and 3.9 to 7.9” VOR, to provide nesting habitat for blue-winged teal and mallard during the restoration process. 	<ul style="list-style-type: none"> ■ Determine the best method possible and begin restoration of 100 percent of the introduced creeping meadow foxtail to native grass and sedges, within 1 year of CCP approval, to provide nesting habitat for blue-winged teal and mallard during the restoration process. 	
<ul style="list-style-type: none"> ■ Conduct a surveillance program for new infestations of invasive plants by walk-through surveys every 2 years in priority areas (roads, boundaries, and heavy use areas), to maintain native prairie. 	<p><i>same as alternative A</i> →</p>		

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

<i>Preserve, restore, and enhance the ecological diversity and abundance of migratory birds of the Intermountain West forest, wetland complexes, riparian habitat, and bunchgrass prairie.</i>			
Migratory Bird Goal			
<i>Objectives for Alternative A</i> (proposed action) –Biological potential emphasis –Compatible public use opportunities	<i>Objectives for Alternative B</i> –Habitat and species protection –Maximum compatible, public use opportunities	<i>Objectives for Alternative C</i> –Habitat restoration and natural processes –Minimum public use opportunities	<i>Objectives for Alternative D</i> (no action) –Custodial management –Limited public use opportunities
WATER BIRDS			
<ul style="list-style-type: none"> ■ Determine waterfowl nest success, causes of nest failure, and food availability through a cooperative project initiated within 5 years of CCP approval, and develop a waterfowl management plan that uses adaptive management to achieve a 5-year average of 25–40 percent nest success, to establish baseline data for a waterfowl management plan that increases waterfowl populations. 	<ul style="list-style-type: none"> ■ Determine current levels of nesting and production of waterfowl, and develop a waterfowl management plan within 5 years of CCP approval that uses adaptive management until a 5-year average of 500 young fledged per year is obtained, to maximize duck production, and improve public use opportunities. 	<ul style="list-style-type: none"> ■ Monitor levels of nesting and production of ducks, and maintain or increase production for the life of the CCP, to support population goals of the North American Waterfowl Management Plan. 	<ul style="list-style-type: none"> ■ Annually monitor waterfowl and other water birds for species presence, population trends, use, and production to evaluate waterfowl production.
<ul style="list-style-type: none"> ■ Annually monitor goose populations in the Flathead Valley by conducting aerial pair and brood counts, to evaluate population trends and goose production. 	<p><i>same as alternative A</i></p> <p>-----></p>		
<ul style="list-style-type: none"> ■ Monitor water bird and shorebird use of the refuge during fall migration to determine limiting factors, within 10 years of CCP approval, to determine effective management to increase fall populations. 	<ul style="list-style-type: none"> ■ Determine limiting factors to fall waterfowl populations, and use adaptive management to increase fall waterfowl numbers by at least 20 percent over the next 10 years, to provide habitat for migratory waterfowl, and improve public use opportunities. 		
<ul style="list-style-type: none"> ■ Evaluate biological potential for shorebirds and marsh birds (including American bittern, sandhill crane, long-billed curlew, and black-crowned night-heron), presence, and nesting within 7 years of CCP approval, to preserve biological integrity. 	<p><i>same as alternative A</i></p> <p>-----></p>		

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

Migratory Bird Goal *Preserve, restore, and enhance the ecological diversity and abundance of migratory birds of the Intermountain West forest, wetland complexes, riparian habitat, and bunchgrass prairie.*

<p><i>Objectives for Alternative A</i> (proposed action)</p> <ul style="list-style-type: none"> -Biological potential emphasis -Compatible public use opportunities 	<p><i>Objectives for Alternative B</i></p> <ul style="list-style-type: none"> -Habitat and species protection -Maximum compatible, public use opportunities 	<p><i>Objectives for Alternative C</i></p> <ul style="list-style-type: none"> -Habitat restoration and natural processes -Minimum public use opportunities 	<p><i>Objectives for Alternative D</i> (no action)</p> <ul style="list-style-type: none"> -Custodial management -Limited public use opportunities
			<ul style="list-style-type: none"> ■ Annually monitor and maintain goose-nesting structures to increase populations of cavity-nesting species.
<p>OTHER MIGRATORY BIRDS</p> <ul style="list-style-type: none"> ■ Monitor Neotropical migratory birds to determine species presence and refuge use; survey throughout habitat development and at least 10 years thereafter, to determine the effects of implementation of the habitat development plan and WRP restoration on these species. 		<p><i>same as alternative A</i> →</p>	
<ul style="list-style-type: none"> ■ Obtain baseline data on relative abundance and production of indicator species of Neotropical migratory birds (as set forth in guidelines by MPIF), owls, and hawks, within 7 years of CCP approval, to determine “best management practices” that will maintain or increase production in the next 10 years to comply with the Conservation of Avian Diversity in North America Policy. 	<p><i>same as alternative A</i> →</p>	<ul style="list-style-type: none"> ■ Develop a conservation plan for Neotropical migratory birds on interagency and private lands in the Pleasant Valley area within 10 years of CCP approval, to preserve a variety of habitats on a landscape level that will maximize species diversity and viability. 	
<ul style="list-style-type: none"> ■ Protect nesting habitats including 80 percent of natural snags, annually monitor and maintain bluebird and wood duck nest boxes, and allow installation of 20 additional nest boxes in available habitat, to increase populations of cavity-nesting species. 	<p><i>same as alternative A</i> →</p>		<ul style="list-style-type: none"> ■ Annually monitor and maintain bluebird and wood duck nest boxes to increase populations of cavity-nesting species.

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

<i>Other Wildlife Goal</i>	<i>Restore and maintain resident and endemic wildlife populations of northwestern Montana to maintain and enhance species diversity of Lost Trail National Wildlife Refuge and Pleasant Valley.</i>		
<i>Objectives for Alternative A</i> (proposed action) –Biological potential emphasis –Compatible public use opportunities	<i>Objectives for Alternative B</i> –Habitat and species protection –Maximum compatible, public use opportunities	<i>Objectives for Alternative C</i> –Habitat restoration and natural processes –Minimum public use opportunities	<i>Objectives for Alternative D</i> (no action) –Custodial management –Limited public use opportunities
<p>LARGE MAMMALS</p> <ul style="list-style-type: none"> ■ Maintain deer, elk, and moose populations at a minimum of 75 percent of current levels on the refuge for the next 15 years, to maintain ecological diversity and a healthy ecosystem. 	<p style="text-align: center;"><i>same as alternative A</i></p> <p style="text-align: center;">-----></p>		
<ul style="list-style-type: none"> ■ Modify or remove all nonessential fences within 1 year of CCP approval, to enhance movement of large mammals. 	<p style="text-align: center;"><i>same as alternative A</i></p> <p style="text-align: center;">-----></p>		
<ul style="list-style-type: none"> ■ Develop a plan for chronic-wasting disease (surveillance and contingencies) within 1 year of CCP approval, to monitor and manage this large mammal disease, and complement state efforts. 	<p style="text-align: center;"><i>same as alternative A</i></p> <p style="text-align: center;">-----></p>		
<ul style="list-style-type: none"> ■ Annually monitor large mammal abundance, presence, and areas of use to establish baseline data for evaluating impacts on habitat, determining if ungulate populations are within the carrying capacity of the refuge, and applying adaptive management. 	<ul style="list-style-type: none"> ■ Monitor large mammal population sizes and areas of use for 5 years after CCP approval, to establish baseline data for development of objectives that enhance viewing, hunting, environmental education, and photography. 	<p style="text-align: center;"><i>same as alternative A</i></p> <p style="text-align: center;">-----></p>	<ul style="list-style-type: none"> ■ Annually compile sightings of and areas of use by large mammals, along with survey data from MFWP, to monitor large mammal populations in Pleasant Valley.
<ul style="list-style-type: none"> ■ Open the refuge to public use only on designated trails from December 15 through April 1 to decrease disturbance and related stress to wintering deer, elk, and moose and to allow recovery of body weight and health in the spring. 		<p style="text-align: center;"><i>same as alternative A</i></p> <p style="text-align: center;">-----></p>	

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

Other Wildlife Goal *Restore and maintain resident and endemic wildlife populations of northwestern Montana to maintain and enhance species diversity of Lost Trail National Wildlife Refuge and Pleasant Valley.*

<p><i>Objectives for Alternative A</i> (proposed action) –Biological potential emphasis –Compatible public use opportunities</p>	<p><i>Objectives for Alternative B</i> –Habitat and species protection –Maximum compatible, public use opportunities</p>	<p><i>Objectives for Alternative C</i> –Habitat restoration and natural processes –Minimum public use opportunities</p>	<p><i>Objectives for Alternative D</i> (no action) –Custodial management –Limited public use opportunities</p>
<p>SMALL MAMMALS</p> <ul style="list-style-type: none"> ■ Monitor Columbian ground squirrel habitat acreage. If monitoring reveals an expansion of 100 percent above baseline, conduct an analysis to determine if habitat damage is sufficient to warrant preparation of a control plan. 	<p><i>same as alternative A</i> →</p>		
<p>RESIDENT BIRDS</p> <ul style="list-style-type: none"> ■ Annually inventory and monitor resident (nonmigratory) birds for 5 years after CCP approval, and evaluate effects of management actions on these species, to contribute to the conservation of resident birds. 	<p><i>same as alternative A</i> →</p>		
	<ul style="list-style-type: none"> ■ Biannually monitor upland game bird populations, and apply adaptive management to foster upland game bird populations, to provide public use opportunities and maintain a healthy ecosystem. 		
		<ul style="list-style-type: none"> ■ Develop prescribed fire plans that would help meet habitat requirements of the flammulated owl and black-backed woodpecker in woodland and forest habitat, within 5 years of CCP approval, to conserve the biological integrity of the ecosystem. 	

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

<p><i>Other Wildlife Goal</i></p>	<p><i>Restore and maintain resident and endemic wildlife populations of northwestern Montana to maintain and enhance species diversity of Lost Trail National Wildlife Refuge and Pleasant Valley.</i></p>		
<p><i>Objectives for Alternative A</i> (proposed action) –Biological potential emphasis –Compatible public use opportunities</p>	<p><i>Objectives for Alternative B</i> –Habitat and species protection –Maximum compatible, public use opportunities</p>	<p><i>Objectives for Alternative C</i> –Habitat restoration and natural processes –Minimum public use opportunities</p>	<p><i>Objectives for Alternative D</i> (no action) –Custodial management –Limited public use opportunities</p>
<p>AMPHIBIANS AND REPTILES</p> <ul style="list-style-type: none"> ■ Gather amphibian population data (in cooperation with the USGS, as part of the “Amphibian Research and Monitoring Initiative”) to develop “best management practices” within 5 years of CCP approval, to determine and address causes of suspected population declines. 	<p style="text-align: center;"><i>same as alternative A</i> →</p>	<p style="text-align: center;"><i>same as alternative A</i> →</p>	<p style="text-align: center;"><i>same as alternative A</i> →</p>
<ul style="list-style-type: none"> ■ Biannually conduct surveys for bullfrogs, and take control actions to prevent the establishment of this species, to protect native amphibians and reptiles from this introduced animal. 	<p style="text-align: center;"><i>same as alternative A</i> →</p>	<p style="text-align: center;"><i>same as alternative A</i> →</p>	<p style="text-align: center;"><i>same as alternative A</i> →</p>
<ul style="list-style-type: none"> ■ Conduct surveys for reptiles every 5 years to determine the range and use of the refuge by reptile species. 	<p style="text-align: center;"><i>same as alternative A</i> →</p>	<ul style="list-style-type: none"> ■ Determine the presence of amphibians and reptiles (through inventories of representative samples of all habitats) to gather baseline and trend data; and establish habitat guidelines for all species found, within 3 years of CCP approval, to conserve the biological integrity of the ecosystem. 	<p style="text-align: center;"><i>same as alternative A</i> →</p>
<p style="text-align: center;"><i>same as alternative A</i> →</p>	<p style="text-align: center;"><i>same as alternative A</i> →</p>	<ul style="list-style-type: none"> ■ Determine what species of amphibians and reptiles are endemic to the refuge and develop restoration plans within 6 years of CCP approval, to conserve the biological integrity of the ecosystem. 	<p style="text-align: center;"><i>same as alternative A</i> →</p>

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

Species of Concern Goal *Contribute to the conservation, enhancement, and recovery of endangered, threatened, and species of concern populations in Lost Trail National Wildlife Refuge and Fisher River watershed.*

<p><i>Objectives for Alternative A</i> (proposed action) –Biological potential emphasis –Compatible public use opportunities</p>	<p><i>Objectives for Alternative B</i> –Habitat and species protection –Maximum compatible, public use opportunities</p>	<p><i>Objectives for Alternative C</i> –Habitat restoration and natural processes –Minimum public use opportunities</p>	<p><i>Objectives for Alternative D</i> (no action) –Custodial management –Limited public use opportunities</p>
<p>■ Document sightings and locations of rare or unusual plants and wildlife, and consider these species’ needs when making management decisions, to ensure the continued existence of rare species.</p>	<p>[Redacted]</p>	<p><i>same as alternative A</i> →</p>	<p>[Redacted]</p>
<p>■ Inventory and monitor species of concern, and rank species according to restoration and protection priorities, within 10 years of CCP approval, to develop guidelines for consideration of these species in management decisions.</p>	<p>■ Monitor for occurrences of species of concern and, for those species that exist on the refuge, develop management objectives that have minimum impact on public use, within 10 years of CCP approval, to protect species of concern while maintaining quality public use.</p>	<p>[Redacted]</p>	<p>[Redacted]</p>
<p>■ Develop a conservation easement program (preliminary project proposal), encompassing the Fisher River watershed, within 3 years of CCP approval, to protect private land from development to minimize wildlife/human conflicts and to conserve habitat for large, far-ranging carnivores.</p>	<p><i>same as alternative A</i> →</p>	<p>[Redacted]</p>	<p>[Redacted]</p>
<p>[Redacted]</p>	<p>■ Develop, within 10 years of CCP approval, a list of birds known to inhabit the refuge including species of concern, their conservation needs, and suggested viewing areas, to raise awareness of species of concern and foster support for their conservation.</p>	<p>■ To enhance the Pleasant Valley ecosystem, within 10 years of CCP approval, monitor and research species of concern and develop restoration or enhancement plans for any species that have historically had a presence in the Pleasant Valley area.</p>	<p>[Redacted]</p>

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

<p><i>Species of Concern Goal</i></p>	<p><i>Contribute to the conservation, enhancement, and recovery of endangered, threatened, and species of concern populations in Lost Trail National Wildlife Refuge and Fisher River watershed.</i></p>		
<p><i>Objectives for Alternative A</i> (proposed action) –Biological potential emphasis –Compatible public use opportunities</p>	<p><i>Objectives for Alternative B</i> –Habitat and species protection –Maximum compatible, public use opportunities</p>	<p><i>Objectives for Alternative C</i> –Habitat restoration and natural processes –Minimum public use opportunities</p>	<p><i>Objectives for Alternative D</i> (no action) –Custodial management –Limited public use opportunities</p>
<p>GRIZZLY BEAR</p> <ul style="list-style-type: none"> ■ Protect the grizzly bear habitat linkage zone between the CYE and the NDCE through coordination with neighboring landowners, within 5 years of CCP approval, to assist in recovery of the grizzly bear. 		<p style="text-align: center;"><i>same as alternative A</i> →</p>	
<ul style="list-style-type: none"> ■ Develop a plan to improve grizzly bear habitat on the refuge within 10 years of CCP approval, to assist in recovery of the grizzly bear. 	<ul style="list-style-type: none"> ■ Improve habitat for grizzly bear within 15 years of CCP approval, to increase the chance of grizzly bear occurrence on the refuge, and improve the potential for public viewing opportunities. 		
<ul style="list-style-type: none"> ■ Prohibit livestock grazing if a grizzly bear is within 1 mile of the refuge, to decrease the likelihood of grizzly bear depredation, forage competition with livestock, and the chance of individual bears becoming habituated to livestock as a food source. 	<p style="text-align: center;"><i>same as alternative A</i></p>		<p style="text-align: right;">→</p>
<ul style="list-style-type: none"> ■ To ensure compliance with the ESA and to support the mission of the Service, minimize conflicts with and disturbance to grizzly bears on the refuge by implementing management and public use restrictions when grizzly bears are within 1 mile of the refuge. 	<p style="text-align: center;"><i>same as alternative A</i></p>		<p style="text-align: right;">→</p>

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

Species of Concern Goal *Contribute to the conservation, enhancement, and recovery of endangered, threatened, and species of concern populations in Lost Trail National Wildlife Refuge and Fisher River watershed.*

<p><i>Objectives for Alternative A</i> (proposed action) –Biological potential emphasis –Compatible public use opportunities</p>	<p><i>Objectives for Alternative B</i> –Habitat and species protection –Maximum compatible, public use opportunities</p>	<p><i>Objectives for Alternative C</i> –Habitat restoration and natural processes –Minimum public use opportunities</p>	<p><i>Objectives for Alternative D</i> (no action) –Custodial management –Limited public use opportunities</p>
<p>■ To improve support for and understanding of grizzly bears, the refuge’s public use staff (or partners) will conduct or coordinate one workshop or field trip per year and will develop at least one interpretive display and one information sheet on the biology and role of grizzly bears in the ecosystem, living with grizzly bears, and the importance of linkage areas to endangered species survival.</p>	<p><i>same as alternative A</i></p>	<p><i>same as alternative A</i></p>	<p><i>same as alternative A</i></p>
<p>GRAY WOLF</p> <p>■ Evaluate the effects of management decisions on gray wolves prior to implementation, and restrict management and public use activities when wolves are present on the refuge, to minimize conflicts with, and disturbance to, gray wolves.</p>	<p><i>same as alternative A</i></p>	<p><i>same as alternative A</i></p>	<p><i>same as alternative A</i></p>
<p>■ Monitor and maintain habitat and sufficient native prey to support one pack of gray wolves in the Pleasant Valley ecosystem within 5 years of CCP approval (in coordination with MFWP, USDA Forest Service, and PCTC), to address a limiting factor to gray wolf survival.</p>	<p><i>same as alternative A</i></p>	<p><i>same as alternative A</i></p>	<p><i>same as alternative A</i></p>
<p>■ Prohibit livestock grazing when a wolf pack is present in Pleasant Valley to minimize conflicts with, and disturbance to, gray wolves.</p>	<p><i>same as alternative A</i></p>	<p><i>same as alternative A</i></p>	<p><i>same as alternative A</i></p>

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

<p>Species of Concern Goal</p>	<p><i>Contribute to the conservation, enhancement, and recovery of endangered, threatened, and species of concern populations in Lost Trail National Wildlife Refuge and Fisher River watershed.</i></p>		
<p><i>Objectives for Alternative A</i> (proposed action) –Biological potential emphasis –Compatible public use opportunities</p>	<p><i>Objectives for Alternative B</i> –Habitat and species protection –Maximum compatible, public use opportunities</p>	<p><i>Objectives for Alternative C</i> –Habitat restoration and natural processes –Minimum public use opportunities</p>	<p><i>Objectives for Alternative D</i> (no action) –Custodial management –Limited public use opportunities</p>
<ul style="list-style-type: none"> ■ To decrease human/wolf conflicts, work with the wolf recovery team to visit with at least 50 percent of neighboring landowners on a yearly basis to exchange wolf sightings and depredation information, and to educate landowners on the status of wolves and new aversion information and techniques. 			
<ul style="list-style-type: none"> ■ To educate the public and foster support for wolf recovery, the refuge’s public use staff in collaboration with the wolf recovery team will have one interpretive field trip or workshop a year, and develop one interpretive display and one information sheet on the biology of wolves and their role in the Pleasant Valley ecosystem within 3 years of CCP approval. 	<p>.....→ <i>same as alternative A</i></p>		
<p>CANADA LYNX</p> <ul style="list-style-type: none"> ■ Evaluate proposed management actions in Canada lynx habitats (forests and woodlands) prior to implementation and prohibit sport trapping of furbearers, to minimize negative impacts to Canada lynx habitat, and to prevent accidental death of Canada lynx. 	<p>.....→ <i>same as alternative A</i></p>		<p>.....→ <i>same as alternative A</i></p>

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

Species of Concern Goal *Contribute to the conservation, enhancement, and recovery of endangered, threatened, and species of concern populations in Lost Trail National Wildlife Refuge and Fisher River watershed.*

<p><i>Objectives for Alternative A</i> (proposed action)</p> <ul style="list-style-type: none"> -Biological potential emphasis -Compatible public use opportunities 	<p><i>Objectives for Alternative B</i></p> <ul style="list-style-type: none"> -Habitat and species protection -Maximum compatible, public use opportunities 	<p><i>Objectives for Alternative C</i></p> <ul style="list-style-type: none"> -Habitat restoration and natural processes -Minimum public use opportunities 	<p><i>Objectives for Alternative D</i> (no action)</p> <ul style="list-style-type: none"> -Custodial management -Limited public use opportunities
<ul style="list-style-type: none"> ■ Identify potential denning and foraging habitat and topographical features important to Canada lynx movement; maintain denning habitat in patches generally larger than 5 acres on at least 25% of the denning area above 1,000 meters in elevation; and maintain habitat connectivity; within 10 years of CCP approval, to enhance habitat for lynx. 			
<p>BALD EAGLE</p> <ul style="list-style-type: none"> ■ Annually monitor bald eagle nesting, and protect habitat within 0.5 mile of any occupied bald eagle nest until the bald eagle is delisted and 5 years thereafter, to eliminate disturbance and enhance bald eagle recovery. 	<p><i>same as alternative A</i></p> <p>-----></p>		
<ul style="list-style-type: none"> ■ To maximize the potential for nesting of the bald eagles on the north shore of Dahl Lake and the continued existence of nesting bald eagles on the refuge, maintain a mature forest stand comprised of aspen, Douglas-fir, ponderosa pine, or mixed conifers with low to moderate canopy cover, of at least 20 acres within 1 mile of Dahl Lake; the stand will contain at least two suitable nest trees and at least three perch trees. 	<p><i>same as alternative A</i></p> <p>-----></p>	<ul style="list-style-type: none"> ■ Identify and manage suitable, unoccupied, bald eagle nesting habitat following the Habitat Management Guide for Bald Eagles in northwestern Montana, within 5 years of CCP approval, to enhance bald eagle recovery. 	

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

<i>Contribute to the conservation, enhancement, and recovery of endangered, threatened, and species of concern populations in Lost Trail National Wildlife Refuge and Fisher River watershed.</i>				
<i>Species of Concern Goal</i>				
<i>Objectives for Alternative A</i> (proposed action) –Biological potential emphasis –Compatible public use opportunities	<i>Objectives for Alternative B</i> –Habitat and species protection –Maximum compatible, public use opportunities	<i>Objectives for Alternative C</i> –Habitat restoration and natural processes –Minimum public use opportunities	<i>Objectives for Alternative D</i> (no action) –Custodial management –Limited public use opportunities	
<ul style="list-style-type: none"> ■ Maintain suitable, bald eagle foraging habitat, minimize disturbance within key areas, and maintain the integrity of the breeding area between 0.5 and 1 mile of any occupied eagle nest until the bald eagle is delisted and 5 years thereafter, to enhance bald eagle recovery. 	<ul style="list-style-type: none"> ■ To enhance recovery of the bald eagle in Montana, eliminate disturbance and protect or enhance breeding habitat within 0.25 mile of any occupied bald eagle nest, until the bald eagle is delisted and for 5 years thereafter. ■ To enhance recovery of the bald eagle in Montana, minimize disturbance and maintain the integrity of the breeding area between 0.25 and 1.0 mile of any occupied bald eagle nest, until the bald eagle is delisted and for 5 years thereafter. 	<ul style="list-style-type: none"> ■ Maintain suitable, bald eagle foraging habitat, minimize disturbance within key areas, and maintain the integrity of the breeding area between 0.5 and 2.5 miles of any occupied eagle nest until the bald eagle is delisted and 5 years thereafter, to enhance bald eagle recovery. ■ Identify and protect bald eagle foraging habitat outside the 2.5-mile home range of known nesting eagles, within 5 years of CCP approval, to maintain adequate prey and minimize disturbance. 		
<ul style="list-style-type: none"> ■ Remove carrion from roadsides immediately upon notification, limit shooting and trapping, and restrict the use of pesticides; evaluate power lines and reduce associated hazards within 5 years of CCP approval, to minimize direct mortality to bald eagles. 	<p><i>same as alternative A</i> →</p>			
	<ul style="list-style-type: none"> ■ Maximize opportunities for education, viewing, and photographing of bald eagles by developing one viewing and photography blind, one interpretive display, and one information sheet within 10 years of CCP approval. 	<ul style="list-style-type: none"> ■ To promote bald eagle recovery and nesting success off-refuge, develop an interpretive handout and provide one outreach program per year about living with eagles and minimizing disturbance. 		

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

Species of Concern Goal *Contribute to the conservation, enhancement, and recovery of endangered, threatened, and species of concern populations in Lost Trail National Wildlife Refuge and Fisher River watershed.*

<p><i>Objectives for Alternative A</i> (proposed action)</p> <ul style="list-style-type: none"> -Biological potential emphasis -Compatible public use opportunities 	<p><i>Objectives for Alternative B</i></p> <ul style="list-style-type: none"> -Habitat and species protection -Maximum compatible, public use opportunities 	<p><i>Objectives for Alternative C</i></p> <ul style="list-style-type: none"> -Habitat restoration and natural processes -Minimum public use opportunities 	<p><i>Objectives for Alternative D</i> (no action)</p> <ul style="list-style-type: none"> -Custodial management -Limited public use opportunities
<p>TRUMPETER SWAN</p> <ul style="list-style-type: none"> ■ Annually monitor trumpeter swan migration and nesting in the Pleasant Valley ecosystem, and protect nesting swans on the refuge from human disturbance from time of arrival until cygnets have fledged, to assist in trumpeter swan conservation. 	<p><i>same as alternative A</i></p> 		
<ul style="list-style-type: none"> ■ Reintroduce trumpeter swans to the Fisher River watershed if suitable habitat is available, within 10 years of CCP approval, to restore trumpeter swans to unoccupied, historical breeding habitat and encourage broader winter distribution. 	<ul style="list-style-type: none"> ■ Within 5 years of CCP approval, evaluate the impact that reintroduction of trumpeter swans to Dahl Lake would have on other lake-dependent species and associated public uses to determine the feasibility of introducing trumpeter swans. 	<ul style="list-style-type: none"> ■ Establish up to four breeding pairs of trumpeter swans on the refuge and surrounding suitable habitat, within 6 years of CCP approval, to restore trumpeter swans to unoccupied, historical breeding habitat and encourage broader winter distribution. 	
	<ul style="list-style-type: none"> ■ Annually monitor trumpeter swan migration and nesting in the Pleasant Valley ecosystem, to assist in trumpeter swan conservation, and to alert the public of potential viewing and photographic opportunities. 	<ul style="list-style-type: none"> ■ To assist in the conservation and protection of trumpeter swans, within 3 years of CCP approval, develop an interpretive handout and provide one outreach program per year about living near swans and minimizing disturbance. 	

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

<p><i>Species of Concern Goal</i></p>	<p><i>Contribute to the conservation, enhancement, and recovery of endangered, threatened, and species of concern populations in Lost Trail National Wildlife Refuge and Fisher River watershed.</i></p>		
<p><i>Objectives for Alternative A</i> (proposed action) –Biological potential emphasis –Compatible public use opportunities</p>	<p><i>Objectives for Alternative B</i> –Habitat and species protection –Maximum compatible, public use opportunities</p>	<p><i>Objectives for Alternative C</i> –Habitat restoration and natural processes –Minimum public use opportunities</p>	<p><i>Objectives for Alternative D</i> (no action) –Custodial management –Limited public use opportunities</p>
<p>BLACK TERN</p> <ul style="list-style-type: none"> ■ Annually monitor the number of nesting black terns, and monitor the tern’s nesting and foraging habitat through the period of wetland restoration and enhancement to determine if emergent vegetation is provided at levels and densities equivalent to or above current levels (80 acres of palustrine, emergent, semipermanent, and flooded vegetation), with a water-to-emergent-vegetation ratio between 25 and 75 percent (as close to 50 percent as possible), and water depths between 0.5 and 1.2 meters at the emergent-vegetation/ open-water interface, to establish baseline data for management decisions, and contribute to statewide conservation of black terns. 	<p style="text-align: center;"><i>same as alternative A</i></p>	<p style="text-align: center;"><i>same as alternative A</i></p>	<p style="text-align: center;"><i>same as alternative A</i></p>
<p>BOREAL TOAD</p> <ul style="list-style-type: none"> ■ Assess the impacts that implementing the habitat development plan would have on the boreal toad population prior to wetland manipulation in those areas documented in 2001–2003 as breeding areas for this species. 	<p style="text-align: center;"><i>same as alternative A</i></p>	<p style="text-align: center;"><i>same as alternative A</i></p>	<p style="text-align: center;"><i>same as alternative A</i></p>
<p style="background-color: #cccccc;"> </p>	<ul style="list-style-type: none"> ■ Determine, during amphibian surveys, the extent of use of refuge habitats by the boreal toad. 	<p style="text-align: center;"><i>same as alternative A</i></p>	<p style="background-color: #cccccc;"> </p>

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

Species of Concern Goal *Contribute to the conservation, enhancement, and recovery of endangered, threatened, and species of concern populations in Lost Trail National Wildlife Refuge and Fisher River watershed.*

<p><i>Objectives for Alternative A</i> (proposed action)</p> <ul style="list-style-type: none"> -Biological potential emphasis -Compatible public use opportunities 	<p><i>Objectives for Alternative B</i></p> <ul style="list-style-type: none"> -Habitat and species protection -Maximum compatible, public use opportunities 	<p><i>Objectives for Alternative C</i></p> <ul style="list-style-type: none"> -Habitat restoration and natural processes -Minimum public use opportunities 	<p><i>Objectives for Alternative D</i> (no action)</p> <ul style="list-style-type: none"> -Custodial management -Limited public use opportunities
<p>SPALDING'S CATCHFLY</p> <ul style="list-style-type: none"> ■ Maintain Spalding's catchfly populations in suitable upland grasslands (minimum population of 350 plants), and inventory 10 percent of suitable habitat each year until all suitable habitat has been evaluated, to protect Spalding's catchfly and provide unique opportunities for visitors to learn about threatened plants. 	<p style="text-align: center;"><i>same as alternative A</i> →</p>	<ul style="list-style-type: none"> ■ Maintain known populations and plants of Spalding's catchfly and restore the catchfly in 75–90 percent of suitable sites, through evaluation of logistics and "best management practices, within 10 years of CCP approval, to protect and restore Spalding's catchfly. 	<div style="background-color: #cccccc; height: 20px; width: 100%;"></div>
<ul style="list-style-type: none"> ■ Inventory for Spalding's catchfly prior to any management actions to prevent destruction of Spalding's catchfly plants or adverse modification of its habitat. 	<p style="text-align: center;"><i>same as alternative A</i> →</p>		
<ul style="list-style-type: none"> ■ Annually control invasive plants around any Spalding's catchfly population that has a minimum of 20 plants, until survey shows there are no invasive plants within a 100-m buffer, to maintain and increase Spalding's catchfly populations. 	<p style="text-align: center;"><i>same as alternative A</i> →</p>		
	<div style="background-color: #cccccc; height: 20px; width: 100%;"></div>	<ul style="list-style-type: none"> ■ Conduct a complete search of suitable habitat to locate Spalding's catchfly and protect its habitat—eliminate grazing, control invasive plants, eliminate herbicide use in the area of the plants, and encourage natural fire regimes—within 5 years of CCP approval, to enhance production and survival of the catchfly. 	<div style="background-color: #cccccc; height: 20px; width: 100%;"></div>

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

<p><i>Protect, manage, and interpret archaeological, cultural, and historical resources present at Lost Trail National Wildlife Refuge for the benefit of present and future generations.</i></p>				
<p>Cultural Resources Goal</p>	<p><i>Objectives for Alternative A</i> (proposed action) –Biological potential emphasis –Compatible public use opportunities</p>	<p><i>Objectives for Alternative B</i> –Habitat and species protection –Maximum compatible, public use opportunities</p>	<p><i>Objectives for Alternative C</i> –Habitat restoration and natural processes –Minimum public use opportunities</p>	<p><i>Objectives for Alternative D</i> (no action) –Custodial management –Limited public use opportunities</p>
<p>■ To preserve resources for all Americans and comply with applicable laws and legislation, maintain and protect documented cultural and historical resources.</p>	<p>same as alternative A</p>			
<p>■ Survey all refuge lands for cultural resources, within 15 years of CCP approval, to preserve resources for all Americans and comply with applicable laws and legislation.</p>	<p>same as alternative A</p>			<p>■ To preserve resources for all Americans and be in compliance with applicable laws and legislation, document, maintain, and protect any previously unknown cultural and historical resources discovered during normal refuge duties.</p>
<p>■ Develop an outreach program to educate the public about cultural and historical aspects of the refuge and foster support and understanding of the management program to protect sensitive aspects of these resources, within 5 years of CCP approval.</p>	<p>same as alternative A</p>			
	<p>■ As a steward of cultural and historical resources to the Nation, research feasibility and restoration of at least one cultural and historical resource, within 10 years of CCP approval.</p>		<p>same as alternative A</p>	
	<p>■ To provide a cultural and historical foundation of Lost Trail National Wildlife Refuge and the Pleasant Valley, develop a museum with displays within 10 years of CCP approval.</p>			

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

<p><i>Provide quality wildlife-dependent recreational and educational opportunities for persons of all abilities to learn, understand, and enjoy the Intermountain ecosystem of northwestern Montana; its associated fish, wildlife, and plants of Lost Trail National Wildlife Refuge; and the National Wildlife Refuge System in a safe and compatible manner.</i></p>				
<p>Public Use Goal</p>	<p><i>Objectives for Alternative A</i> (proposed action) –Biological potential emphasis –Compatible public use opportunities</p>	<p><i>Objectives for Alternative B</i> –Habitat and species protection –Maximum compatible, public use opportunities</p>	<p><i>Objectives for Alternative C</i> –Habitat restoration and natural processes –Minimum public use opportunities</p>	<p><i>Objectives for Alternative D</i> (no action) –Custodial management –Limited public use opportunities</p>
<p>■ Develop a demographic profile of wildlife-dependent recreational users (users within a 2-hour commuting radius) within 2 years of CCP approval, to determine the long-term direction to provide for quality, public use opportunities.</p>	<p><i>same as alternative A</i></p> <p>→</p>			
<p>■ Develop and implement a visitor service plan within 2 years of CCP approval, to provide the highest quality wildlife-dependent recreational opportunities.</p>	<p><i>same as alternative A</i></p> <p>→</p>			
<p>■ Develop one accessible day use area within 3 years of CCP approval, to encourage participation in wildlife-dependent use opportunities, which will foster appreciation and support for fish, wildlife, and their habitat.</p>	<p><i>same as alternative A</i></p> <p>→</p>	<p>■ Develop accessible facilities such as restrooms and drinkable water, within 3 years of CCP approval, to provide quality, wildlife-dependent, public use opportunities.</p>	<p>■ Provide limited support facilities (drinking water and restrooms) at the visitor contact station within 1 year of CCP approval, to support authorized public use.</p>	
<p>■ To reduce disturbance and increase nest success probability, site-specific management activities or public use activities will not be permitted within 0.5-mile of any occupied golden eagle nest.</p>	<p><i>same as alternative A</i></p> <p>→</p>			
	<p>■ Allow access for nonmotorized floating devices on Dahl Lake, within 2 years of CCP approval, to support quality wildlife observation, photography, and fishing opportunities.</p>			<p>■ Adopt the public access guidelines outlined in the tear sheet in appendix F to provide visitors with compatible public use opportunities.</p>

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

Public Use Goal Provide quality wildlife-dependent recreational and educational opportunities for persons of all abilities to learn, understand, and enjoy the Intermountain ecosystem of northwestern Montana; its associated fish, wildlife, and plants of Lost Trail National Wildlife Refuge; and the National Wildlife Refuge System in a safe and compatible manner.

<p><i>Objectives for Alternative A</i> (proposed action)</p> <ul style="list-style-type: none"> -Biological potential emphasis -Compatible public use opportunities 	<p><i>Objectives for Alternative B</i></p> <ul style="list-style-type: none"> -Habitat and species protection -Maximum compatible, public use opportunities 	<p><i>Objectives for Alternative C</i></p> <ul style="list-style-type: none"> -Habitat restoration and natural processes -Minimum public use opportunities 	<p><i>Objectives for Alternative D</i> (no action)</p> <ul style="list-style-type: none"> -Custodial management -Limited public use opportunities
<p>HUNTING</p> <ul style="list-style-type: none"> ■ Allow elk, deer, mountain grouse, and turkey hunting under MFWP regulations, starting fall 2002 in designated areas; and provide a quality hunting experience to persons of all abilities within 5 years of hunt plan approval, resulting in at least 90 percent of hunters reporting a quality hunt, to provide quality opportunities for persons of all abilities to take part in hunting. 	<p><i>same as alternative A</i></p>		
<ul style="list-style-type: none"> ■ Provide special youth-only hunts for deer and elk, during the first week of archery season and the first week of rifle season, starting fall 2002 to promote understanding, appreciation, and stewardship of the refuge and all system lands. 	<p><i>same as alternative A</i></p>		
<ul style="list-style-type: none"> ■ Provide easily accessible information to and personal contact with hunters for at least 95 percent compliance with refuge regulations, within 5 years of CCP approval, to encourage hunters to practice the highest standards of ethical behavior in attempts at taking wildlife. 	<p><i>same as alternative A</i></p>		
<p>FISHING</p> <ul style="list-style-type: none"> ■ Determine, within 5 years of CCP approval, the feasibility of restoration of native sport fisheries, to address a previously unavailable use opportunity. 	<p><i>same as alternative A</i></p>		

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

Provide quality wildlife-dependent recreational and educational opportunities for persons of all abilities to learn, understand, and enjoy the Intermountain ecosystem of northwestern Montana; its associated fish, wildlife, and plants of Lost Trail National Wildlife Refuge; and the National Wildlife Refuge System in a safe and compatible manner.

Public Use Goal

<p><i>Objectives for Alternative A</i> (proposed action)</p> <ul style="list-style-type: none"> -Biological potential emphasis -Compatible public use opportunities 	<p><i>Objectives for Alternative B</i></p> <ul style="list-style-type: none"> -Habitat and species protection -Maximum compatible, public use opportunities 	<p><i>Objectives for Alternative C</i></p> <ul style="list-style-type: none"> -Habitat restoration and natural processes -Minimum public use opportunities 	<p><i>Objectives for Alternative D</i> (no action)</p> <ul style="list-style-type: none"> -Custodial management -Limited public use opportunities
<ul style="list-style-type: none"> ■ Carry out planning, funding, evaluation, and implementation of a restoration program for native fisheries—through at least four partnerships—within 5 years of determining a native sports fisheries is feasible, to develop quality, sport-fishing opportunities. 	<p><i>same as alternative A</i> →</p>	<ul style="list-style-type: none"> ■ Carry out evaluation and restoration of refuge wetlands and streams, with support and partners, within 1 year of CCP approval, to restore native fisheries and protect the Pleasant Valley ecosystem. 	<ul style="list-style-type: none"> ■ Evaluate the existence of viable sport fish populations in Dahl Lake and Pleasant Valley and Meadow creeks every 5 years and, within 2 years of reaching a viable sport fishery population, develop a fishing plan that outlines steps to provide a quality fishing program, to increase public use opportunities.
<ul style="list-style-type: none"> ■ Open at least 30 percent of fishable waters along Pleasant Valley Creek and Dahl Lake, with a minimum of one accessible fishing area that provides safe and uncrowded fishing opportunities, within 2 years of restoring a viable sport fishery if determined feasible, to provide a quality fishing experience. 	<ul style="list-style-type: none"> ■ Allow fishing on 60 percent of waters within refuge boundaries in compliance with MFWP, within 2 years of CCP approval, to facilitate fishing opportunities for persons of all abilities. 	<ul style="list-style-type: none"> ■ Do not permit fishing for the duration of the CCP to protect natural resources. 	<ul style="list-style-type: none"> ■ Provide a quality fishing experience to persons of all abilities, if fish population levels are viable, with at least 90 percent of anglers reporting quality fishing experiences within 5 years of the fishing plan approval, to increase public use opportunities.
<ul style="list-style-type: none"> ■ Provide one fishing event for youth per year, involving at least 20 participants, within 2 years of hiring a public use employee, to increase youth appreciation of fish and fishing. 	<p><i>same as alternative A</i> →</p>	<ul style="list-style-type: none"> ■ Provide one off-refuge fishing event for youth per year involving at least 20 participants, in coordination with partners, within 2 years of hiring a public use employee, to increase youth appreciation of fish and fishing. 	

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

Public Use Goal *Provide quality wildlife-dependent recreational and educational opportunities for persons of all abilities to learn, understand, and enjoy the Intermountain ecosystem of northwestern Montana; its associated fish, wildlife, and plants of Lost Trail National Wildlife Refuge; and the National Wildlife Refuge System in a safe and compatible manner.*

<p><i>Objectives for Alternative A</i> (proposed action)</p> <ul style="list-style-type: none"> -Biological potential emphasis -Compatible public use opportunities 	<p><i>Objectives for Alternative B</i></p> <ul style="list-style-type: none"> -Habitat and species protection -Maximum compatible, public use opportunities 	<p><i>Objectives for Alternative C</i></p> <ul style="list-style-type: none"> -Habitat restoration and natural processes -Minimum public use opportunities 	<p><i>Objectives for Alternative D</i> (no action)</p> <ul style="list-style-type: none"> -Custodial management -Limited public use opportunities
<p>WILDLIFE OBSERVATION AND PHOTOGRAPHY</p> <ul style="list-style-type: none"> ■ Provide opportunities for wildlife observation and photography by providing public access with minimal disturbance to wildlife and habitat, and developing designated viewing sites (one wildlife drive, two accessible wildlife-viewing areas, and one accessible trail), resulting in a 90 percent visitor satisfaction rate within 5 years of CCP approval, to promote public appreciation of natural and cultural resources. 	<ul style="list-style-type: none"> ■ Develop observation and photography sites (one wildlife drive, three accessible wildlife-viewing areas, one accessible viewing platform, two accessible trails, and one accessible observation blind) within 5 years of CCP approval, to develop wildlife observation and photography as the most common wildlife-dependent recreational use. 	<ul style="list-style-type: none"> ■ Develop observation and photography sites (four accessible wildlife-viewing areas, one accessible wildlife-viewing platform, and one accessible trail) within 5 years of CCP approval, to promote quality opportunities to the public. 	<div style="background-color: #cccccc; height: 100px;"></div>
<ul style="list-style-type: none"> ■ Make contact with 90 percent of visitors via the visitor contact station, interpretive materials, and interpretive kiosks, starting within 2 years of CCP approval, to provide quality wildlife observation and photography opportunities, and promote public appreciation of natural and cultural resources. 	<p style="text-align: center;"><i>..... same as alternative A →</i></p>	<ul style="list-style-type: none"> ■ Provide information about the best observation sites and successful photography techniques to 90 percent of visitors via the visitor contact station, interpretive materials, and interpretive kiosks to provide quality wildlife observation and photography opportunities. 	<ul style="list-style-type: none"> ■ Provide information about wildlife observation and photography opportunities to 90 percent of visitors via the refuge office, parking lot kiosks, and public use tear sheets, within 2 years of CCP approval, to provide all visitors with opportunities to observe and photograph wildlife.

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

Provide quality wildlife-dependent recreational and educational opportunities for persons of all abilities to learn, understand, and enjoy the Intermountain ecosystem of northwestern Montana; its associated fish, wildlife, and plants of Lost Trail National Wildlife Refuge; and the National Wildlife Refuge System in a safe and compatible manner.

Public Use Goal

<p><i>Objectives for Alternative A</i> (proposed action) –Biological potential emphasis –Compatible public use opportunities</p>	<p><i>Objectives for Alternative B</i> –Habitat and species protection –Maximum compatible, public use opportunities</p>	<p><i>Objectives for Alternative C</i> –Habitat restoration and natural processes –Minimum public use opportunities</p>	<p><i>Objectives for Alternative D</i> (no action) –Custodial management –Limited public use opportunities</p>
<p>■ Encourage the highest standards of ethical behavior by the public during wildlife observation and photography, with 90 percent of visitors understanding and following procedures within 5 years of CCP approval, to provide quality wildlife observation and photography opportunities and limit resource damage.</p>	<p><i>same as alternative A</i> →</p>		
	<p>■ Permit authorized public access (mostly foot travel) within 2 years of CCP approval on 60–100 percent of the refuge at all times, unless closures are required to protect life, property, or resources, to provide visitors with opportunities to observe and photograph wildlife in its natural habitat without compromising the resources for which the refuge was established.</p>	<p>■ Permit authorized public access on designated trails and roads to provide visitors with opportunities to observe and photograph wildlife in its natural habitat, and foster wildlife populations by limiting disturbance.</p>	
	<p>■ Within 3 years of CCP approval and receiving adequate funding and staffing, develop and implement a program to allow for special wildlife observation and photographic opportunities under a regulated permit system to foster an appreciation of special resources.</p>		

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

Public Use Goal
Provide quality wildlife-dependent recreational and educational opportunities for persons of all abilities to learn, understand, and enjoy the Intermountain ecosystem of northwestern Montana; its associated fish, wildlife, and plants of Lost Trail National Wildlife Refuge; and the National Wildlife Refuge System in a safe and compatible manner.

<p><i>Objectives for Alternative A</i> (proposed action)</p> <ul style="list-style-type: none"> -Biological potential emphasis -Compatible public use opportunities 	<p><i>Objectives for Alternative B</i></p> <ul style="list-style-type: none"> -Habitat and species protection -Maximum compatible, public use opportunities 	<p><i>Objectives for Alternative C</i></p> <ul style="list-style-type: none"> -Habitat restoration and natural processes -Minimum public use opportunities 	<p><i>Objectives for Alternative D</i> (no action)</p> <ul style="list-style-type: none"> -Custodial management -Limited public use opportunities
<p>INTERPRETATION</p> <ul style="list-style-type: none"> ■ Develop interpretive materials and disseminate them to at least 90 percent of visitors, within 2 years of program funding and staffing to promote public appreciation of natural and cultural resources. 	<p><i>same as alternative A</i></p>		
<ul style="list-style-type: none"> ■ Develop interpretive themes within 10 years of hiring a public use specialist. Major themes will include wetlands, endangered species, history of Pleasant Valley, management of Lost Trail National Wildlife Refuge, the National Wildlife Refuge System, and the Service, to increase visitors' understanding and support, as well as their appreciation of fish, wildlife, plants, and their habitats. 	<p><i>same as alternative A</i></p>		
<ul style="list-style-type: none"> ■ Ensure that at least 75 percent of visitors understand wetland values and the refuge's contribution to restoration and protection of Pleasant Valley wetlands, within 5 years of CCP approval, to promote public appreciation of natural resources. 	<ul style="list-style-type: none"> ■ Ensure that at least 80 percent of visitors understand wetland values and the refuge's contribution to restoration and protection of Pleasant Valley wetlands, within 5 years of CCP approval, to promote public appreciation of natural resources. 	<ul style="list-style-type: none"> ■ Ensure that at least 85 percent of visitors understand wetland values and the refuge's contribution to restoration and protection of Pleasant Valley wetlands, within 5 years of CCP approval, to promote public appreciation of natural resources. 	
	<ul style="list-style-type: none"> ■ Provide interpretive programs that receive public participation, with yearly increases of at least 10 percent, for the next 10 years, to foster appreciation and understanding of the refuge and its associated wildlife and habitats. 	<ul style="list-style-type: none"> ■ Ensure that at least 75 percent of visitors understand and comply with restrictions of public access to large portions of the backcountry, to increase support of management decisions to restore and protect refuge resources. 	

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

Public Use Goal *Provide quality wildlife-dependent recreational and educational opportunities for persons of all abilities to learn, understand, and enjoy the Intermountain ecosystem of northwestern Montana; its associated fish, wildlife, and plants of Lost Trail National Wildlife Refuge; and the National Wildlife Refuge System in a safe and compatible manner.*

<p><i>Objectives for Alternative A</i> (proposed action)</p> <ul style="list-style-type: none"> -Biological potential emphasis -Compatible public use opportunities 	<p><i>Objectives for Alternative B</i></p> <ul style="list-style-type: none"> -Habitat and species protection -Maximum compatible, public use opportunities 	<p><i>Objectives for Alternative C</i></p> <ul style="list-style-type: none"> -Habitat restoration and natural processes -Minimum public use opportunities 	<p><i>Objectives for Alternative D</i> (no action)</p> <ul style="list-style-type: none"> -Custodial management -Limited public use opportunities
	<ul style="list-style-type: none"> ■ To reduce disturbance to wildlife and educate the public, develop an interpretive display that informs visitors of the importance of winter range to ungulates, within 5 years of CCP approval. 	<ul style="list-style-type: none"> ■ Develop a bald eagle interpretive handout and provide one outreach program per year. ■ Develop an interpretive, trumpeter swan handout and provide one outreach program per year. 	
<p>ENVIRONMENTAL EDUCATION</p> <ul style="list-style-type: none"> ■ Develop an extensive environmental education program, including development of a formal partnership, within 5 years of CCP approval, to allow students and educators to gain hands-on experiences and appreciation of natural resources. 	<p><i>same as alternative A</i> →</p>		
<ul style="list-style-type: none"> ■ Develop and maintain a lending library of extensive materials and resources within 2 years of CCP approval, to provide up-to-date and Service-related environmental education materials for educators. 	<p><i>same as alternative A</i> →</p>		

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

<p><i>Provide quality wildlife-dependent recreational and educational opportunities for persons of all abilities to learn, understand, and enjoy the Intermountain ecosystem of northwestern Montana; its associated fish, wildlife, and plants of Lost Trail National Wildlife Refuge; and the National Wildlife Refuge System in a safe and compatible manner.</i></p>				
<p>Public Use Goal</p>	<p><i>Objectives for Alternative A</i> (proposed action) –Biological potential emphasis –Compatible public use opportunities</p>	<p><i>Objectives for Alternative B</i> –Habitat and species protection –Maximum compatible, public use opportunities</p>	<p><i>Objectives for Alternative C</i> –Habitat restoration and natural processes –Minimum public use opportunities</p>	<p><i>Objectives for Alternative D</i> (no action) –Custodial management –Limited public use opportunities</p>
<p>■ Provide on-site field trips to educators and students upon request to foster stewardship of the land, understand the refuge mission of conserving natural resources, and experience the wonder of native fish, wildlife, and plants as well as the culture and history of the area.</p>	<p>■ Collaborate with local educational groups and schools (within 1-hour commuting distance—Pleasant Valley, Marion, and Kalispell), and conduct a minimum of one field trip or environmental education activity per school each year, to foster stewardship of the land, understanding of the refuge vision of conserving natural resources, and experiencing the wonder of natural and cultural resources.</p>	<p>■ Provide at least one in-class environmental education program per school each year, for schools within a 1-hour commute, to foster stewardship of the land, understanding of the refuge vision of conserving natural resources, and experiencing the wonder of native plants and animals, as well as cultural resources.</p> <p>■ Recruit students and educators to contribute to data-gathering and restoration activities, as measured by number of participants and number of returnees each year, to foster understanding of natural and cultural resources, and effectively achieve management and restoration goals.</p>	<p>■ Encourage students and educators within the Pleasant Valley, Lost Prairie, and Marion areas to visit the refuge once a year to foster stewardship of the land, understanding of the refuge vision of conserving natural resources, and experiencing the wonder of natural and cultural resources.</p>	
<p>■ Develop an accessible campground for overnight use by educational groups, within 1 year of implementation of an environmental education program, to allow students and educators to gain hands-on experience and appreciation of natural resources.</p>	<p>■ Develop an accessible campground with 10 campsites for overnight use by the public during the summer (Memorial Day weekend to Labor Day weekend) and to educational groups during spring and fall, within 4 years of CCP approval, to support and encourage quality wildlife-dependent recreational use, and allow students and educators to gain hands-on experience and appreciation of natural resources.</p>	<p>■ Develop an accessible campground for overnight use by educational groups within 2 years of implementation of an environmental education program, to allow students and educators to gain hands-on experience and appreciation of natural resources.</p>		

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

<i>Provide staffing, funding, and facilities to maintain the long-term integrity of habitats and wildlife resources of Lost Trail National Wildlife Refuge in supporting the achievement of ecosystem and National Wildlife Refuge System goals.</i>			
Administration Goal	<i>Objectives for Alternative B</i>	<i>Objectives for Alternative C</i>	<i>Objectives for Alternative D</i>
<p><i>Objectives for Alternative A</i> (proposed action)</p> <ul style="list-style-type: none"> -Biological potential emphasis -Compatible public use opportunities 	<ul style="list-style-type: none"> -Habitat and species protection -Maximum compatible, public use opportunities 	<ul style="list-style-type: none"> -Habitat restoration and natural processes -Minimum public use opportunities 	<p>(no action)</p> <ul style="list-style-type: none"> -Custodial management -Limited public use opportunities
OPERATIONS			
<ul style="list-style-type: none"> ■ Form a new complex comprised of Lost Trail National Wildlife Refuge, Swan River National Wildlife Refuge, and Flathead County units of the Northwest Montana WMD, separate from the National Bison Range complex, within 15 years of CCP approval, to better address interests unique to this area of northwestern Montana and anticipated increased public use. 	<p><i>same as alternative A</i></p> 		
<ul style="list-style-type: none"> ■ Provide adequate resources and staff to administer, develop, and maintain refuge habitat, facilities, programs, and public use for the period of this CCP, within 2 years of CCP approval, to perform the restoration, management, activities, and monitoring described in the CCP to achieve the refuge's goals. 	<p><i>same as alternative A</i></p> 		<ul style="list-style-type: none"> ■ Continue coordination with the lead biologist for the National Bison Range complex regarding biological program needs and opportunities for the period of this CCP. ■ Maintain current equipment in a safe and efficient working condition to administer the refuge safely and efficiently.
<ul style="list-style-type: none"> ■ Provide on-site law enforcement (overt, covert, and preventative) within 1 year of CCP approval, to provide quality public use experiences, while ensuring the protection of refuge resources. 	<p><i>same as alternative A</i></p> 		<ul style="list-style-type: none"> ■ Provide law enforcement during hunting seasons and high visitor use periods, and coordinate with MFWP to enforce state hunting laws for the duration of this CCP, to provide natural resource protection and public safety.
<ul style="list-style-type: none"> ■ Annually use volunteers to assist with maintenance, biological monitoring, and public use activities to effectively and efficiently implement the CCP. 	<p><i>same as alternative A</i></p> 		

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

<p><i>Provide staffing, funding, and facilities to maintain the long-term integrity of habitats and wildlife resources of Lost Trail National Wildlife Refuge in supporting the achievement of ecosystem and National Wildlife Refuge System goals.</i></p>			
<p>Administration Goal</p>			
<p><i>Objectives for Alternative A</i> (proposed action) –Biological potential emphasis –Compatible public use opportunities</p>	<p><i>Objectives for Alternative B</i> –Habitat and species protection –Maximum compatible, public use opportunities</p>	<p><i>Objectives for Alternative C</i> –Habitat restoration and natural processes –Minimum public use opportunities</p>	<p><i>Objectives for Alternative D</i> (no action) –Custodial management –Limited public use opportunities</p>
<p>FACILITIES</p>			
<p>■ Provide adequate administrative and maintenance facilities within 3 years of CCP approval, and ensure needed facilities and structures are maintained to Service standards during the period of this CCP, to provide support for refuge staff and programs, and for public safety.</p>	<p><i>same as alternative A</i> →</p>		<p>■ Repair and maintain existing facilities, buildings, fences, and roads on an “as-needed basis” for the duration of this CCP, to provide basic support for refuge staff, and provide for public safety.</p>
<p>■ Identify and remove unnecessary structures and facilities within 10 years of CCP approval, to provide for restoration of habitat, protection of wildlife, reduction of maintenance needs, and public safety.</p>	<p><i>same as alternative A</i> →</p>		
	<p>■ Restore and protect 28 miles of graveled and two-tracked grass roads and travel lanes for the duration of the CCP, to provide an efficient and safe road system for administrative and public use.</p>	<p><i>same as alternative B</i> →</p>	
<p>Partnership Goal</p>			
<p><i>Promote and develop partnerships with adjacent landowners, public and private organizations, and other interested individuals to preserve, restore, and enhance a diverse and productive ecosystem of which Lost Trail National Wildlife Refuge is an integral part.</i></p>			
<p>■ Meet once a year with the NRCS and private landowners in the Pleasant Valley to coordinate and collaborate on an interagency land steward partnership to protect more than 5,800 acres of wetland and wetland-related habitat, within 3 years of CCP approval.</p>			

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

<p><i>Promote and develop partnerships with adjacent landowners, public and private organizations, and other interested individuals to preserve, restore, and enhance a diverse and productive ecosystem of which Lost Trail National Wildlife Refuge is an integral part.</i></p>			
<p>Partnership Goal</p>	<p><i>Objectives for Alternative B</i></p> <p>–Habitat and species protection –Maximum compatible, public use opportunities</p>	<p><i>Objectives for Alternative C</i></p> <p>–Habitat restoration and natural processes –Minimum public use opportunities</p>	<p><i>Objectives for Alternative D</i></p> <p>(no action) –Custodial management –Limited public use opportunities</p>
<p><i>Objectives for Alternative A</i> (proposed action) –Biological potential emphasis –Compatible public use opportunities</p>			
<p>■ Partner with nongovernmental organizations (RMEF, Audubon Society, Landmark Volunteers, MCC, and Flathead Wildlife, Inc.) to conduct habitat and maintenance activities and collect biological data for the first 5 years after CCP approval, to increase conservation efforts.</p>	<p><i>same as alternative A</i></p>		
<p>■ Develop a “friends group” for a mutually agreed-upon area of the refuge within 3 years of CCP approval, to enhance management, programs, or funding of refuge programs.</p>	<p><i>same as alternative A</i></p>		
<p>■ In conjunction with PCTC; MFWP, Montana DNRC; USDA Forest Service; and private landowners, determine the opportunities and feasibility for a forest legacy easement within 5 years of CCP approval.</p>			
<p>■ Share law enforcement responsibilities with MFWP during deer, elk, and upland game bird hunting seasons, on and adjacent to the refuge, for the duration of this CCP, to efficiently provide quality public use experiences, while ensuring the protection of refuge resources. Coordinate with the local sheriff’s office and the Montana Highway Patrol to address and deal with potential issues outside of the hunting season and to provide law enforcement personnel with backup and law enforcement assistance when needed.</p>	<p><i>same as alternative A</i></p>		

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

<p><i>Promote and develop partnerships with adjacent landowners, public and private organizations, and other interested individuals to preserve, restore, and enhance a diverse and productive ecosystem of which Lost Trail National Wildlife Refuge is an integral part.</i></p>			
<p>Partnership Goal</p>			
<p><i>Objectives for Alternative A</i> (proposed action) –Biological potential emphasis –Compatible public use opportunities</p>	<p><i>Objectives for Alternative B</i> –Habitat and species protection –Maximum compatible, public use opportunities</p>	<p><i>Objectives for Alternative C</i> –Habitat restoration and natural processes –Minimum public use opportunities</p>	<p><i>Objectives for Alternative D</i> (no action) –Custodial management –Limited public use opportunities</p>
<p>■ Meet once a year with PCTC, RMEF, Flathead and Lincoln counties weed departments, and the USDA Forest Service to maintain partnerships for collaboration and mutual assistance with invasive plant control, access, and road maintenance issues, for the period of this CCP.</p>	<p><i>same as alternative A</i></p>		
<p>■ For the period of this CCP, collaborate with the Flathead County Road Department regarding refuge signage and potential cooperative road maintenance and possible relocation issues concerning Pleasant Valley Road.</p>	<p><i>same as alternative A</i></p>		
<p>■ Continue issuing annual special-use permits with the USDA Forest Service for use, maintenance, and invasive plant control on refuge road North 1019, as needed for the period of this CCP.</p>	<p><i>same as alternative A</i></p>		
<p>■ Continue coordination with Bonneville Power Administration regarding the power line easement for the duration of this CCP.</p>	<p><i>same as alternative A</i></p>		
<p>■ Maintain the statewide memorandum of understanding with the Montana DNRC for wildland-fire suppression efforts for 15 after CCP approval.</p>			
<p>■ For the period of this CCP, continue coordination with PCTC and their lessee regarding grazing issues on adjacent PCTC lands.</p>			

Table 13. Summary of alternatives and objectives for the CCP for Lost Trail National Wildlife Refuge, Montana

<p><i>Promote and develop partnerships with adjacent landowners, public and private organizations, and other interested individuals to preserve, restore, and enhance a diverse and productive ecosystem of which Lost Trail National Wildlife Refuge is an integral part.</i></p>			
<p>Partnership Goal</p>			
<p><i>Objectives for Alternative A (proposed action)</i></p> <ul style="list-style-type: none"> -Biological potential emphasis -Compatible public use opportunities 	<p><i>Objectives for Alternative B</i></p> <ul style="list-style-type: none"> -Habitat and species protection -Maximum compatible, public use opportunities 	<p><i>Objectives for Alternative C</i></p> <ul style="list-style-type: none"> -Habitat restoration and natural processes -Minimum public use opportunities 	<p><i>Objectives for Alternative D (no action)</i></p> <ul style="list-style-type: none"> -Custodial management -Limited public use opportunities
	<ul style="list-style-type: none"> ■ Collaborate with the Retired Senior Volunteer Program to provide assistance with refuge maintenance, restoration, and public use programs, and provide volunteers an opportunity to stay and work within the Pleasant Valley. 		

ELIMINATED ALTERNATIVES

Many ideas for the focus of management on the refuge were developed. One alternative that was considered, but eliminated from further analysis, is described below:

- Similar to alternative C, the former alternative E called for removal of all structures (excepting the peripheral fence delineating the refuge’s boundary). Natural processes would restore habitats their presettlement condition and function. All habitats would be protected from human-induced impacts.
- Close examination of this alternative revealed that some elements would not allow the purposes for which the refuge was established to be fulfilled.
- Useful components of alternative E were incorporated into an expanded alternative C.

Objectives from the hunt plan are included in all alternatives that follow. They are provided only as information in this EA, not as part of the decision process.

ALTERNATIVE A

PROPOSED ACTION

The biological potential of native plants and wildlife is provided through restored and enhanced habitats.

Use by an informed public does not impede reaching the biological potential.

Staffing is minimal, and facilities are improved.

Partnerships accomplish habitat management and foster conservation.

This alternative is the proposed action of the Service for the CCP for Lost Trail National Wildlife Refuge.



Hooded Merganser Brood
John and Karen Hollingsworth/USFWS

RIPARIAN HABITAT

Stream channels and associated vegetation are addressed in the management direction for riparian habitat. Water control structures that affect the functioning of riparian habitat, as well as fish passage, are addressed.

GOAL

Restore, enhance, and maintain a mixed deciduous and coniferous riparian habitat to support indigenous wildlife species and perpetuate the ecological integrity of the Fisher River watershed.

Riparian Habitat Objectives

The basis for the following objectives and strategies is described in rationales 1–5, found in appendix H.

- The Service will maintain coordination and collaboration for restoration of the stream vegetation and stream meander on the WRP easement to the south end of Pleasant Valley Creek, and Meadow Creek after it flows west from the water control structure until it joins with Pleasant Valley Creek, by meeting with the NRCS annually.
- Inventory and evaluate willow, alder, and birch vegetation (20 acres) in the Dahl Lake wetlands within 5 years of CCP approval, to determine the potential to increase plant diversity and habitat for migratory songbirds.
- Restore stream bank vegetation (willow, alder, hawthorn) within a 20-foot buffer with 75 percent canopy cover, along 0.9 mile of Pleasant Valley Creek (north of breached water control structure) within 5 years of CCP approval, to enhance nesting and foraging materials for migratory birds, and reduce water temperature for fish and amphibians.
- Evaluate three ponds, three water control structures, and three culverts along Pleasant Valley Creek within 5 years of CCP approval, to determine effects on stream quality (siltation and temperature) and downstream fisheries.
- Enhance the integrity of the Pleasant Valley Creek restoration project by working with NRCS; MFWP; and private landowners to make the full length of Pleasant Valley Creek on and off the refuge fish passage-friendly within 8 years of CCP approval.
- Maintain, and increase when feasible, quaking aspen acreage on the refuge in the Dahl Lake wetland complex [currently unit 12 (3 acres), unit 14 (23 acres), and unit 19 (24 acres); figure 2].

Strategies

Study stream characteristics and the biological potential of Pleasant Valley Creek, in collaboration with NRCS; MFWP; and Trout Unlimited.

Revegetate the north section of Pleasant Valley Creek where alders have died and channel meander is being restored at Lower Moose Pond, in collaboration with NRCS.

Manage riparian areas and willow stands to maintain or achieve midaged condition or higher in areas above 3,300 feet elevation for lynx habitat.

Determine viability of sport fish populations by evaluating species presence, potential for continued reproduction, population size capable of supporting expected fishing pressure, and recovery of absent species.

Remove fish barriers in Pleasant Valley Creek downstream from the refuge, in collaboration with NRCS and private landowners.

Use prescribed fire in early spring, late summer, or fall (Howard 1996, Tirmenstein 1988) to promote quaking aspen for rejuvenation of existing stands or increase coverage of aspen.

Review literature for water regimes and soil types required for willow, alder, and birch.

Provide one full-time biologist to monitor fish recovery and populations.

Monitor stream temperature and siltation in Pleasant Valley Creek each summer after revegetation has occurred, in collaboration with MFWP.

Monitor revegetation along Pleasant Valley Creek through vegetation classification every third year.

Establish point counts in stream habitat to determine if revegetation along Pleasant Valley Creek enhances use by birds.

Conduct surveys for migratory birds, songbirds, amphibians, and vegetation before and after restoration efforts in refuge ponds and Pleasant Valley Creek, in collaboration with NRCS and volunteers.

WETLAND HABITAT

Lakes, bogs, and other saturated wetland areas are addressed in the management direction for wetland habitat.

GOAL

Provide breeding, resting, and feeding habitat for wetland-dependent species of northwestern Montana by restoring, maintaining, and enhancing a mosaic of lake, semipermanent, seasonal, temporary, and saturated wetlands.

Wetland Habitat Objectives

The basis for the following objectives and strategies is described in rationales 8–13, found in appendix H.

- Recharge 100 percent of drained wetlands to 75–100 percent capacity within 5 years of CCP approval, to foster wetland recharge and promote wetland revegetation for wildlife habitat.
- Maintain wetland basins, other than the Dahl Lake complex, with a minimum 50:50 water-to-cover ratio well interspersed, within 5–10 years of CCP approval, to provide foraging and nesting habitat for water birds.
- Restore Dahl Lake complex water levels to gain a minimum of 200 acres of temporary wetlands, and restore temporary wetlands (80 acres) to seasonal and semipermanent wetlands that fluctuate naturally (figure 3), within 5 years of CCP approval, to provide water bird foraging and nesting habitat.
- Increase ground-nesting habitat with construction of up to five nesting islands on Dahl Lake within 11 years of CCP approval, if soil plasticity is suitable for proper construction, to increase wildlife habitat.
- Conduct a wetland study in the Dahl Lake complex to determine how montane wetlands function as recharge and discharge basins within 6 years of CCP approval, to determine effects on vegetative, invertebrate, and wildlife associations.
- Restore natural wetland vegetation in Dahl Lake wetland complex by reducing reed canarygrass by 40–80 percent within 10 years of CCP approved, to allow the reestablishment of sedge, rush, mint, pondweed, cattail, and bulrush as the dominant plant species.
- Inventory for fens (alkaline bogs) within 1 year of CCP approval, to protect from invasive plants.

Strategies

Restore or increase water holding capabilities in wetlands on the WRP easement, e.g., plug ditches, in coordination with the NRCS.

Install a water control structure in the culvert near headquarters to allow water to fill the wetland to road height without washing out the road.

If runoff should not be adequate the first year for wetland refill of each restored basin, divert water for 1 year to initiate recharge of the basin.

Plug wetland drain ditches in the wetlands west of Dahl Lake within the west mitigative parcel.

Fill the drain ditch (Meadow Creek) coming out of the west end of Dahl Lake with off-site spoils that remain on-site, and by trucking in spoils to fill the ditch back west to the location of the old water control structure (figure 3).

Use rest, grazing, haying, and prescribed fire to maintain open water and remove decadent, residual, emergent vegetation with adaptive management.

Allow wetlands to recharge and discharge with naturally occurring seasonal fluctuations. Use no control structures to manipulate water depth.

Construct 0.5-acre nesting islands to be irregular in shape with 5:1 slopes, top-dressed with soil, and seeded with native grasses and legumes for ground-nesting habitat.

Monitor wetland-vegetation coverage response to recharge every third year; map in the geographical information system (GIS).

Annually monitor vegetative response by measuring habitat coverage; map in GIS.

Survey wet meadows for dominant plant species and presence of peat; measure pH of soil in suspect areas.

Annually conduct pair-count surveys for water birds to monitor use of wetlands pre- and post-refill.

GRASSLAND HABITAT

This management direction is for the diverse grasslands that cover the majority of the refuge.

GOAL

Restore, enhance, and maintain Intermountain grasslands, with an emphasis on native bunchgrass prairie, to provide habitat for migratory birds, species of concern, and associated wildlife species.

Grassland Habitat Objectives

The basis for the following objectives and strategies is described in rationales 18–24, found in appendix H.

- Fence and post the entire refuge boundary within 3 years of CCP approval, to make clear to the public when they have entered or exited the refuge, and to prohibit unauthorized livestock grazing.
- Develop soil descriptions for the entire refuge within 1 year of CCP approval (coordinate with NRCS), for a baseline understanding of soils to help with future management considerations.
- Maintain native grasslands (1,450 acres) not closely associated with wetlands (north of Pleasant Valley Road, figure 4), for a healthy Palouse prairie grassland dominated by Idaho and rough fescues, and western wheatgrass [Idaho fescue with average 8–12 flower stalks per plant, 20–22 centimeters in maximum leaf length per plant, 14–17 square centimeters live basal area (Mueggler 1970, 1975), and an average 12.7–22.9 centimeters leaf height (Pond 1960); and rough fescue with an average 25–30 centimeters leaf height (McLean and Wikeem 1985)], to provide a vigorous plant community for ground-nesting migratory birds and forage for other wildlife.
- Monitor, every 2 years, 336 acres of western wheatgrass in management units 13 and 14, and 45 acres of Kentucky bluegrass in management

unit 19 (figures 2 and 4), and maintain as medium-tall, dense grasslands with litter depth of 15–30 mm and 1.5–2 decimeters VOR to provide habitat for nesting blue-winged and cinnamon teal (Barker et al. 1990, Gilbert and Woodling 1996, Livezey 1981).

- Monitor, every 2 years, 190 acres of Idaho fescue and western wheatgrass in upland grasslands around the Dahl Lake wetland complex (management unit 11, figures 2 and 4), and maintain as tall, dense grasslands with litter depth of 15–30 mm and 3 decimeters VOR (Kirsch et al. 1978, Duebbert and Lokemoen 1976, Kruse and Bowen 1996), to provide nesting habitat for mallard, gadwall, and lesser scaup.
- Monitor 900 acres dominated by Idaho fescue and rough fescue (management units 8–10, 12, 15, and 20; figure 2) every 2 years; for Idaho fescue with an average 8–12 flower stalks per plant, 20–22 centimeters maximum leaf length per plant, 14–17 square centimeters live basal area (Mueggler 1970, 1975), and an average 12.7–22.9 centimeters leaf height (Pond 1960); to determine when management action is needed to maintain vigorous plant communities for ground-nesting migratory birds and forage for other wildlife.

Strategies

Fence and post the refuge boundary; use staff from the National Bison Range complex or contracted personnel.

Use wildlife-friendly fencing in areas of high wildlife use, where feasible.

Survey or find markers in areas of uncertainty for the refuge boundary.

Use existing soils layers to determine which soils have not been classified.

Sample soils and describe associated climax vegetation for each unclassified type; perform through a request to the NRCS.

Gather technical guides for vegetative climax communities for each soil type; coordinate with NRCS.

Set priorities for restoration within the WRP easement (345 acres) in the bottomlands (see south of the county road, figure 4), in collaboration with NRCS restoration efforts.

Complete WRP restoration of the remaining 512 acres in the bottomlands and 145 acres in the uplands, after securing funding.

Determine the best restoration method and plant species of replacement; consult with experts and review literature.

Maintain native Palouse prairie habitat in and around the Spalding's catchfly site with sufficient, native forb composition to attract, but not compete for, pollinators.

Develop a habitat management plan describing how rest, prescribed fire, grazing, or haying will be used to maintain migratory bird nesting habitat in areas of: (1) western wheatgrass and Kentucky bluegrass; and (2) Idaho fescue and western wheatgrass on upland grasslands.

Use grazing and prescribed fire as habitat management tools for Idaho or rough fescue once monitoring results demonstrate management targets have been achieved and compatibility agreements have been developed with the NRCS.

Rest, grazing, and prescribed fire may be used as habitat management tools once monitoring results demonstrate native grassland targets have been achieved.

Use short-term management practices (e.g., grazing or fire) to remove decadent, residual vegetation every 5–7 years (Kirsch et al. 1978), 6–7 years (Gilbert and Woodling 1996), 5–10 years (Barker et al. 1990) depending upon productivity, precipitation, and monitoring results.

Monitor vegetation (live basal area, leaf height, leaf length, and flower stalks/plant) to determine current habitat condition and monitor for management thresholds every 2 years.

Monitor plant species occurrence and percent cover along with wildlife use pre- and postrestoration.

FOREST HABITAT

Coniferous and deciduous forests are addressed in the management direction for forest habitat.

GOAL

Enhance and maintain Douglas-fir, ponderosa pine, aspen, and cottonwood forested habitats within the context of the Fisher River watershed for migratory birds, species of concern, and other associated wildlife species.

Forest Habitat Objectives

The basis for the following objectives and strategies is described in rationales 29–32, found in appendix H.

- Identify forest coverage types within 1 year of CCP approval, to ensure management activities do not hinder the biological potential of forest habitats.
- Evaluate forest coverage, age, and density related to surrounding lands owned by PCTC and USDA Forest Service within 4 years of CCP approval, to determine what habitat type is the least

represented in the ecosystem that can be managed for on suitable refuge lands.

- For the duration of the CCP, maintain a ponderosa pine, mixed-conifer forest with widely spaced trees (20-foot spacing between pines), open grassy areas, and an understory of fescue or junegrass and snowberry or kinnikinnick, to conserve a major forest type that facilitates the biological integrity of the ecosystem.

Strategies

Inventory forest cover type, age, and density in Pleasant Valley through habitat classification and discuss management options for the refuge from an ecosystem perspective, in collaboration with PCTC, Montana Department of State Lands, and USDA Forest Service.

Categorize forest stands by species, age, and density; perform through a request to PCTC and USDA Forest Service. Determine how to best provide a corridor of habitat connectivity for the grizzly bear, gray wolf, and Canada lynx to national forests, working with endangered species biologists.

Survey for deteriorating aspen stands—as defined by a low density of stems that are young and small, and with poorer form and higher crown/stem ratios than healthy stands (Schier and Campbell 1978).

Review forest lands for habitat needs by rare, threatened, and endangered species.

Halt Douglas-fir encroachment of young even-aged stands of ponderosa pine; remove Douglas-fir > 2 feet tall and up to 6 inches dbh, and ponderosa pine > 2 feet tall and up to 4 inches dbh.

Suppress understory fires except in areas where age-class structure is being altered to abnormally dense stands dominated by younger trees.

Maintain all existing large snags and broken-top trees > 20 inches dbh for nesting purposes.

Maintain the bald eagle habitat (aspen stand) on the north shore of Dahl Lake in a healthy productive condition through the use of fencing, cattle grazing, flooding, prescribed fire, and protection from beavers.

Evaluate the potential for aspen and conifer stands around Dahl Lake to provide habitat for nesting bald eagles; apply appropriate management techniques.

Identify Canada lynx habitat by ground-truthing areas identified as mature forest through vegetative classification mapping.

Measure current woody debris and analyze the potential for lynx denning sites.

Maintain habitat connectivity by managing for intermediate successional stages in forest habitats between lynx foraging and denning habitat.

Provide prey for Canada lynx by managing for snowshoe hare habitat; identify areas of forest above 3,300 feet in elevation to manage in an early successional stage with dense understory.

Provide prey for Canada lynx by maintaining long-term habitat for snowshoe hare; identify suitable habitat on neighboring PCTC lands and coordinate with timber managers to maintain habitat.

Develop a fire management plan for forests above 3,300 feet in elevation that mimics natural fire regimes for Canada lynx habitat.

Protect lynx denning cover by creating firebreaks to prevent natural fire from spreading in or out of areas where fuels have built up in areas managed for Canada lynx denning.

Prohibit precommercial thinning or clear-cutting of woodland Canada lynx habitat.

Restrict livestock use in openings created by fire or timber harvest that would delay successful regeneration of the shrub and tree components in forests above 3,300 feet in elevation, for Canada lynx habitat.

Manage grazing in aspen stands to ensure sprouting and sprout survival in aspen stands above 3,300 feet elevation for Canada lynx habitat.

Review forest lands on and near the refuge for threats from development.

Determine opportunities for establishing a forest legacy easement, through discussions with partners.

Acquire a forest legacy easement to protect forests adjacent to the refuge and within the Pleasant Valley from development, in collaboration with all partners.

Classify forest vegetation into National Vegetation Classification Standards; map in geographic information system database.

Inventory forest use by Neotropical migratory birds, native mammals, amphibians, and reptiles to obtain baseline data.

Annually monitor for effects of any restoration project on aspen, willow, birch, and alder.

Annually monitor for negative effects of water level changes on aspen groves in management units 12 (3 acres), 14 (23 acres) and 19 (24 acres) to determine if there is a loss in acreage.

Monitor effects of prescribed fire in aspen and apply adaptive management.

INVASIVE PLANTS

Prevention and control of nonnative, invasive plants are addressed in the management direction for invasive plants.

GOAL

Native plant communities, composition, occurrence, and density exist without degradation by invasive plants, and support associated wildlife.

Invasive Plant Objectives

The basis for the following objectives and strategies is described in rationales 36–40, found in appendix H.

- Develop and implement an invasive plant management plan within 1 year of CCP approval that identifies: (1) the extent of encroachment by spotted knapweed, tansy ragwort, and sulfur cinquefoil; (2) suitable control methods; and (3) monitoring needs; to document infestations and provide an index to effectiveness of management actions.
- Reduce spotted knapweed to a level of 25 percent or less of overall grassland area within 3 years of CCP approval, to maintain native vegetation for wildlife forage, cover, and nesting.
- Annually eradicate and maintain 75–90 percent control of tansy ragwort with an extensive survey and treatment effort coordinated with PCTC and the state coordinator for tansy ragwort, to maintain native vegetation for wildlife forage, cover, and nesting.
- Annually conduct invasive plant control on 200–400 acres of upland grasslands for 15 years after CCP approval, to maintain native prairie composed of 90 percent native vegetation composition.
- Restore native grasses and sedges over 85 percent of the area where there is introduced creeping meadow foxtail (figure 4), starting within 1 year of CCP approval, to increase plant diversity and provide wildlife habitat.
- Conduct a surveillance program for new infestations of invasive plants by walk-through surveys every 2 years in priority areas (roads, boundaries, and heavy use areas), to maintain native prairie.

Strategies

Evaluate invasive plant infestations and control efforts since refuge establishment.

Evaluate invasive plant infestations within Pleasant Valley for priority areas of control by each partner.

Determine appropriate, effective control methods, e.g., mowing, chemical, biocontrol, and prescribed fire; consult with experts.

Determine the best restoration method and plant species of replacement in invasive plant infestations; consult with experts and review literature.

Gather information about cumulative impacts of chemical, biocontrol, and prescribed fire effects on invasive plants and on native vegetation response; review literature.

Determine the best method of reducing reed canarygrass, including use of chemicals, fire, disking, and grazing.

Evaluate soils and water regime for optimum sites for reed canarygrass control.

Use the GIS to predict areas at greatest risk of new invasions and develop early detection and prevention measures.

Share GIS layers of invasive plant infestations with PCTC and the USDA Forest Service.

Apply integrated pest management for spotted knapweed, consisting of: (1) proper spring and fall chemical applications; (2) mechanical mowing where practical, prior to seed head production; and (3) release of appropriate biocontrol agents, including seed head gall flies and other proven biocontrol agents.

Use hand pulling, hand spraying, and all-terrain vehicles (ATVs) for herbicide application in areas within 330 feet of Spalding's catchfly populations.

Evaluate the target species selectiveness of any biocontrol species prior to release.

Treat new invasions of tansy ragwort in late July and early August by bagging flower heads and burning them, and spraying rosettes with chemicals such as Transline or Tordon.

Control invasive plants with cutting and herbicide in forest.

Survey proposed spray areas for Spalding's catchfly prior to herbicide application.

Use ground and aerial herbicides to inhibit and eradicate encroachment by invasive plants.

Coordinate invasive plant control in Pleasant Valley by meeting at least once per year to share information and discuss control strategies: (1) with PCTC for spotted knapweed; and (2) with PCTC and the USDA Forest Service for tansy ragwort.

Continue to discuss, with partners, alternatives for invasive plant control within the Pleasant Valley.

Map sites of invasive plant treatment each year in the GIS.

Develop a strategy with partners for control of tansy ragwort and how to prevent it from becoming a dominant plant species within the Pleasant Valley.

Attain assistance with tansy ragwort control from the Tansy Trust Fund Grant program, as well as from the Service's challenge cost-share grants.

Attain herbicide and/or a technician to apply herbicide and assist with mapping by pursuing grant funding.

Attain assistance with invasive plants (applications and monitoring) by pursuing grant funding through the project advisory committee, e.g., RMEF grants, until the refuge can support its own needs for control.

Mitigate disturbance on refuge roads with invasive plant control and reseedling of native species through the ongoing memorandum of understanding with PCTC.

Limit off-road vehicle travel and wash the undercarriages of vehicles that access off-road areas.

Determine the extent of infestation of sulfur cinquefoil; create a baseline map.

Monitor infestation rates and effectiveness of control efforts; annually map the extent of infestation of spotted knapweed and tansy ragwort in GIS.

Identify locations of new infestations of tansy ragwort; map locations and collaborate with the state coordinator for mapping records for neighboring PCTC land.

Monitor reed canarygrass control efforts, vegetation coverage, and use adaptive management.

Monitor vegetation of upland grasslands for vigor and plant species composition every 2 years.

Gather information about invasive plant occurrence; inform all Service employees that may work on the refuge about plant and habitat characteristics of invasive plants to get help finding invasive plants during normal field duties.

Conduct walk-through surveys for invasive plants with volunteers to look for new infestations.

MIGRATORY BIRDS

Management direction for migratory birds addresses water birds (waterfowl, shorebirds, and other water birds) and other migratory birds.

GOAL

Preserve, restore, and enhance the ecological diversity and abundance of migratory birds of the Intermountain West forest, wetland complexes, riparian habitat, and bunchgrass prairie.

Migratory Bird Objectives

The basis for the following objectives and strategies is described in rationales in appendix H.

Water Bird Objectives

Rationales 42–47 are found in appendix H.

- Determine waterfowl nest success, causes of nest failure, and food availability through a cooperative project initiated within 5 years of CCP approval, and develop a waterfowl management plan that uses adaptive management to achieve a 5-year average of 25–40 percent nest success, to establish baseline data for a waterfowl management plan that increases waterfowl populations.
- Annually monitor goose populations in the Flathead Valley by conducting aerial pair and brood counts, to evaluate population trends and goose production.
- Monitor water bird and shorebird use of the refuge during fall migration to determine limiting factors, within 10 years of CCP approval, to determine effective management to increase fall populations.
- Evaluate biological potential for shorebirds and marsh birds (including American bittern, sandhill crane, long-billed curlew, and black-crowned night-heron), presence, and nesting within 7 years of CCP approval, to preserve biological integrity.

Strategies

Hire a biologist or biological technician to be stationed at the refuge.

Hire a full-time biologist or biological technician to be stationed at the refuge.

Determine limiting factors and conduct research; consult with the Montana Cooperative Wildlife Research Unit and other experts.

Use habitat manipulation and predator control as adaptive management tools to increase production when necessary to achieve objectives.

Determine nesting requirements of shorebirds and marsh birds and best management practices; review literature.

Prohibit haying, mowing, and grazing immediately proceeding and during the nesting season of shorebirds and marsh birds.

Restrict public use to designated trails and roads from May 15 to September 1 in bottomlands between South Pleasant Valley Road and the county road to decrease disturbance to nesting birds and increase nest success.

Continue to prohibit waterfowl hunting until a minimum average of 1,000 ducks from opening day

of waterfowl season until the start of freeze-up are present.

Evaluate sandhill crane nesting; develop a plan to improve nesting if cranes are nesting or attempting to nest on the refuge.

Conduct weekly waterfowl surveys from mid-August until freeze up.

Continue duck pair counts and implement duck brood index survey.

Survey for availability of dense, tall (>60 centimeters) emergent vegetation for nesting cover for bitterns, terns, and redheads.

Continue established point counts; conduct additional surveys (point counts, nest dragging, nest searching, and playback surveys) in the upland grasses, forest, and NRCS restoration areas.

Initiate nest dragging to determine hen success and rates of nest predation.

Conduct invertebrate and vegetation surveys to determine available forage from mid-August until freeze-up.

Monitor invertebrate levels in Dahl Lake and wetland complex to determine if this is a limiting factor.

Inventory and monitor emergent and submergent vegetation availability as forage or forage substrate in late summer and fall.

Monitor for shorebirds and marsh birds during duck pair and brood counts, Neotropical migratory bird surveys, and with playbacks.

Other Migratory Birds Objectives

Rationales 54–59 are found in appendix H.

- Monitor Neotropical migratory birds to determine species presence and refuge use; survey throughout habitat development and at least 10 years thereafter, to determine the effects of implementation of the habitat development plan and WRP restoration on these species.
- Obtain baseline data on relative abundance and production of indicator species of Neotropical migratory birds (as set forth in guidelines by MPIF), owls, and hawks, within 7 years of CCP approval, to determine “best management practices” that will maintain or increase production in the next 10 years to comply with the Conservation of Avian Diversity in North America Policy (USFWS 1990).
- Protect nesting habitats including 80 percent of natural snags, annually monitor and maintain bluebird and wood duck nest boxes, and allow installation of 20 additional nest boxes in available

habitat, to increase populations of cavity-nesting species.

Strategies

Construct and place new nest boxes for Neotropical migratory birds in unoccupied, suitable habitat using volunteers.

Set priorities for species by habitat and sensitivity rating and manage for key indicator species in each habitat; use the MPIF guidance.

Analyze survey data for the most common priority species and their habitat requirements; apply adaptive management to foster their populations.

Maintain diverse healthy habitat and an abundant prey base for raptors.

Protect snags in forest habitat.

Conduct Neotropical migratory bird surveys, and nest success monitoring in forest, shrubland, cottonwood, and aspen habitats.

Continue existing Neotropical migratory bird surveys along Pleasant Valley Creek and the refuge road system with staff or volunteers.

Conduct additional surveys and nest success monitoring for Neotropical migratory birds to more closely examine the effects of the Pleasant Valley Creek restoration project, working with NRCS, partners, and volunteers.

Conduct owl surveys in suitable habitat following the protocol set out in Guidelines for Nocturnal Owl Monitoring in North America (March 2001) as a silent listening technique, adding playback surveys that are recorded separately.

Conduct surveys that detect woodpeckers.

Monitor nesting and maintain structures and boxes using volunteers and refuge staff.

OTHER WILDLIFE

Resident wildlife including large and small mammals, resident birds, amphibians, and reptiles are addressed in the management direction for other wildlife.

GOAL

Restore and maintain resident and endemic wildlife populations of northwestern Montana to maintain and enhance species diversity of Lost Trail National Wildlife Refuge and Pleasant Valley.

Other Wildlife Objectives

The basis for the following objectives and strategies is described in rationales in appendix H.

Large Mammal Objectives

Rationales 61–67 are found in appendix H.

- Maintain deer, elk, and moose populations at a minimum of 75 percent of current levels on the refuge for the next 15 years, to maintain ecological diversity and a healthy ecosystem.
- Modify or remove all nonessential fences within 1 year of CCP approval, to enhance movement of large mammals.
- Develop a plan for chronic-wasting disease (surveillance and contingencies) within 1 year of CCP approval, to monitor and manage this large mammal disease, and complement state efforts.
- Annually monitor large mammal abundance, presence, and areas of use to establish baseline data for evaluating impacts on habitat, determining if ungulate populations are within the carrying capacity of the refuge, and applying adaptive management.
- Open the refuge to public use only on designated trails from December 15 through April 1 to decrease disturbance and related stress to wintering deer, elk, and moose and to allow recovery of body weight and health in the spring.

Strategies

Improve habitat quality through invasive plant control, native plant restoration, prescribed fire, and grazing.

Hire a biologist to monitor and evaluate wildlife population dynamics, and to conduct necessary control.

Hire biological staff or use the biologist from the National Bison Range complex, along with volunteers, to conduct monitoring

Construct temporary fences (electric or barbless wire) if needed.

Identify fence locations and determine their importance for refuge management; map using a global positioning system.

Remove all fences (interior only) or modify fences for wildlife-friendly movement. Remove either the top and bottom wire or two bottom wires so the bottom wire is at least 18 inches off the ground; remove stays to enhance movement or use lay-down wires.

Incorporate additional gates into fences where it is not feasible to modify them; keep gates open when livestock are not present in grazing units.

Develop a system to estimate deer and elk populations on the refuge; review literature for current, valid methods.

Determine best management practices to use in response to monitoring data on deer and elk populations and how they are being affected by refuge management or how they are affecting the refuge; coordinate with MFWP. Apply adaptive management, e.g., modify hunting seasons, or use fire, invasive plant control, or grazing to improve forage.

Determine areas of large mammal concentrations (winter range) and avoid public use in these areas.

Determine if large mammal resource damage is a result of local factors or reflects an ecosystem phenomenon, through comparison of deer and elk population trends on the refuge with MFWP trend data for the ecosystem.

Coordinate proposed prevention, surveillance, research, and control actions for chronic-wasting disease in cooperation with state wildlife and agriculture agencies.

Conduct outreach to surrounding communities and communication to refuge visitors regarding chronic-wasting disease and disease management.

Remain alert to potential threats from chronic-wasting disease or other diseases.

Determine baseline populations of large mammals; monitor for 3 years and consult MFWP.

Monitor abundance and presence of elk (in the winter), deer (in the summer), and moose (in the spring or summer).

Determine the cause of any decrease below 75 percent of current herd sizes for deer, elk, and moose; determine if modifications in management are warranted. Monitor deer and elk to determine high-use areas and design public use activities around these areas.

Categorize the vegetation in areas of high use by deer, elk, and moose; map locations and categories.

Ensure deer and elk are staying within the carrying capacity; evaluate areas of high use for browse-line impacts.

Evaluate the effects of public use in areas of habitat damage to determine if overuse of specific habitats by deer and elk is a result of wildlife response to disturbance.

Educate the public on how to minimize winter disturbance and stress to large mammals during recreation activities.

Conduct a passive surveillance program for clinical signs of chronic-wasting disease or other health problems (may lead to a targeted surveillance based on results); conduct monthly, opportunistic observations of deer and elk.

Monitor deer, elk, and moose use of refuge habitats to determine high-use areas and design public use activities around these areas.

Evaluate all public uses for their effects on herd numbers and distribution of wildlife on the refuge.

Small Mammal Objectives

Rationales 70–71 are found in appendix H.

- Monitor Columbian ground squirrel habitat acreage. If monitoring reveals an expansion of 100 percent above baseline, conduct an analysis to determine if habitat damage is sufficient to warrant preparation of a control plan.

Strategies

Determine ground squirrel activity centers; map by size of population and damage to vegetation in the GIS.

Determine an acceptable baseline level for habitat affected by ground squirrels and their population numbers, using initial data.

Maintain ground squirrel numbers within 20 percent of a baseline determined after initial monitoring and literature research.

Determine changes in acres affected by ground squirrels; monitor ground squirrel activity on a 3- to 5-year basis.

Resident Bird Objectives

Rationales 72–75 are found in appendix H.

- Annually inventory and monitor resident (nonmigratory) birds for 5 years after CCP approval, and evaluate effects of management actions on these species, to contribute to the conservation of resident birds.

[Specific objectives have not been developed for upland game birds under this alternative. However, it is expected that habitat objectives would indirectly benefit upland game species.]

Strategies

Limit disturbance within at least 0.5-mile from any occupied golden eagle nest; consider temporary implementation of alternate routes of public use or management.

Determine potential effects of management activities to species listed as priority for conservation by MPIF Plan (Casey 2000) or the Service's office of migratory bird management (1995).

Continue annual Neotropical migratory bird surveys and detect all resident and migratory birds through addition of one survey route in the uplands.

Inventory for Montana Bird Conservation Plan priority 1 species such as flammulated owls and black-backed woodpeckers.

Implement an owl survey once a year for the next 3 years, using volunteers.

Monitor for the arrival and nesting of golden eagles.

Record any incidental sightings of bird species on the refuge.

Amphibian and Reptile Objectives

Rationales 78–81 are found in appendix H.

- Gather amphibian population data (in cooperation with the USGS, as part of the “Amphibian Research and Monitoring Initiative”) to develop “best management practices” within 5 years of CCP approval, to determine and address causes of suspected population declines.
- Biannually conduct surveys for bullfrogs, and take control actions to prevent the establishment of this species, to protect native amphibians and reptiles from this introduced animal.
- Conduct surveys for reptiles every 5 years to determine the range and use of the refuge by reptile species.

Strategies

Develop habitat guidelines for amphibians and reptiles; consult experts.

Learn survey techniques and design surveys; coordinate with the “Amphibian Research and Monitoring Initiative” team.

Gather amphibian population data on the refuge as part of the “Amphibian Research and Monitoring Initiative,” in partnership with USGS researchers.

Teach all staff to identify bullfrogs.

Contact local experts about eradication procedures for bullfrogs.

Report amphibian data to the regional level, i.e., “Amphibian Research and Monitoring Initiative” team, to support ecosystem-level monitoring.

Collaborate with amphibian and reptile biologists to determine the effects of implementing the habitat management plan may have on the boreal toad.

Hire biological staff to conduct monitoring and control, if necessary, for bullfrogs.

Include the use of equipment, housing, or vehicles for refuge in-kind support to the USGS for the “Amphibian Research and Monitoring Initiative.”

SPECIES OF CONCERN

This management direction addresses wildlife listed by state or federal agencies as threatened and endangered (or proposed or candidate for listing), sensitive, rare, or species of concern. For the refuge, the species of concern are listed below:

- grizzly bear
- gray wolf
- Canada lynx
- bald eagle
- trumpeter swan
- black tern
- boreal toad
- Spalding's catchfly (plant)

GOAL

Contribute to the conservation, enhancement, and recovery of endangered, threatened, and species of concern populations in Lost Trail National Wildlife Refuge and Fisher River watershed.

Species of Concern Objectives

The basis for the following objectives and strategies is described in rationales 83–85 in appendix H.

General Objectives

- Document sightings and locations of rare or unusual plants and wildlife, and consider these species' needs when making management decisions, to ensure the continued existence of rare species.
- Inventory and monitor species of concern, and rank species according to restoration and protection priorities, within 10 years of CCP approval, to develop guidelines for consideration of these species in management decisions.
- Develop a conservation easement program (preliminary project proposal), encompassing the Fisher River watershed, within 3 years of CCP approval, to protect private land from development to minimize wildlife/human conflicts and to conserve habitat for large, far-ranging carnivores.

Strategies

Categorize species as follows: (1) priority 1—species that would be managed for protection or increase of populations; (2) priority 2—species that would be considered when evaluating effects of management options, but whose habitats would not be targeted for management; and (3) priority 3—species whose habitat requirements would not be considered in making management decisions.

Focus inventory efforts and determine reestablishment potential; research historical occurrence data and use.

Develop a conservation strategy with PCTC to protect their lands from future development.

Develop a preliminary project proposal for the conservation easement program, delineating a focus zone and priority areas.

Hire a biologist to be stationed at the refuge to coordinate grizzly bear, Canada lynx, and black tern management; and monitor the trumpeter swan reintroduction.

Seek funding from the Land and Water Conservation Fund for a conservation easement program.

Monitor for occurrence of species of concern in Pleasant Valley, in coordination with partners, interns, and volunteers.

Record sightings of rare species during routine staff and volunteer duties.

Survey for owls, rails, and rare species; and monitor bald eagle nests and black tern nesting colonies; request assistance from Audubon volunteers.

Hire a biologist to be stationed at the refuge to coordinate monitoring.

Monitor and survey to develop comprehensive species lists; use refuge staff, interns, and volunteers.

Grizzly Bear Objectives

Rationales 87–91 are found in appendix H.

- Protect the grizzly bear habitat linkage zone between the CYE and the NCDE through coordination with neighboring landowners, within 5 years of CCP approval, to assist in recovery of the grizzly bear.
- Develop a plan to improve grizzly bear habitat on the refuge within 10 years of CCP approval, to assist in recovery of the grizzly bear.
- Prohibit livestock grazing if a grizzly bear is within 1 mile of the refuge, to decrease the likelihood of grizzly bear depredation, forage competition with livestock, and the chance of individual bears becoming habituated to livestock as a food source.
- To ensure compliance with the ESA and to support the mission of the Service, minimize conflicts with and disturbance to grizzly bears on the refuge by implementing management and public use restrictions when grizzly bears are within 1 mile of the refuge.

- To improve support for and understanding of grizzly bears, the refuge’s public use staff (or partners) will conduct or coordinate one workshop or field trip per year and will develop at least one interpretive display and one information sheet on the biology and role of grizzly bears in the ecosystem, living with grizzly bears, and the importance of linkage areas to endangered species survival.

Strategies

Evaluate current grizzly habitat components of Pleasant Valley; use the GIS and consultation with neighbors.

Complete a biological assessment and interagency cumulative effects assessment of existing and proposed land uses that could affect grizzly bears or their habitat.

Work with the interpretation and education subcommittee of the Interagency Grizzly Bear Committee.

Concentrate refuge efforts to supply those components of grizzly bear habitat that are limiting in the Pleasant Valley area.

Determine the effects that proposed management actions would have on grizzly bears; consult with biologists.

Identify and secure funding for conservation easements in the grizzly linkage zone; coordinate with the Interagency Grizzly Bear Coordination Team, the Flathead and Kootenai national forests, PCTC, MFWP, Montana DNRC, NRCS, and private landowners.

Close designated areas to all public access (based on each particular situation) when one or more grizzly bears are within 1 mile of the refuge.

Close areas for grizzly bears through the use of signs and other informational material; enforce closures through law enforcement patrols.

Follow guidelines of the Grizzly Bear Compendium (LeFranc et al. 1987) to evaluate habitat and security within Pleasant Valley.

Follow guidelines of the Grizzly Bear Compendium (LeFranc et al. 1987) to provide habitat and security within the Pleasant Valley area.

Supply those components of grizzly bear habitat that are limiting in Pleasant Valley.

Limit administrative activity in areas of grizzly bear activity.

Prevent livestock–bear competition for spring forage by restricting livestock grazing if a grizzly bear is within 1 mile of the refuge.

Prohibit hunting of ground squirrels unless it becomes biologically necessary to protect resources.

Prohibit black bear hunting.

Monitor the occurrence and location of grizzly bears in Pleasant Valley, in collaboration with private landowners, MFWP, Interagency Grizzly Bear Coordination Team, USDA Forest Service, and PCTC.

Gray Wolf Objectives

Rationales 93–98 are found in appendix H.

- Evaluate the effects of management decisions on gray wolves prior to implementation, and restrict management and public use activities when wolves are present on the refuge, to minimize conflicts with, and disturbance to, gray wolves.
- Monitor and maintain habitat and sufficient native prey to support one pack of gray wolves in the Pleasant Valley ecosystem within 5 years of CCP approval (in coordination with MFWP, USDA Forest Service, and PCTC), to address a limiting factor to gray wolf survival.
- Prohibit livestock grazing when a wolf pack is present in Pleasant Valley to minimize conflicts with, and disturbance to, gray wolves.
- To decrease human/wolf conflicts, work with the wolf recovery team to visit with at least 50 percent of neighboring landowners on a yearly basis to exchange wolf sightings and depredation information, and to educate landowners on the status of wolves and new aversion information and techniques.
- To educate the public and foster support for wolf recovery, the refuge’s public use staff in collaboration with the wolf recovery team will have one interpretive field trip or workshop a year, and develop one interpretive display and one information sheet on the biology of wolves and their role in the Pleasant Valley ecosystem within 3 years of CCP approval.

Strategies

Determine the effects that proposed management actions would have on gray wolves; consult with biologists.

Maintain sufficient natural prey to support one pack of wolves in Pleasant Valley; use adaptive management.

Foster prey for the gray wolf (deer and elk) by improving winter range: apply integrated pest management, plant desirable forage species, and limit disturbance from public use.

When wolves are residing in Pleasant Valley, communicate with the wolf recovery team, MFWP, PCTC, and surrounding landowners.

Close the refuge to public access within 1 mile of any active wolf den or rendezvous site from May 1 to July 1.

Close designated areas of the refuge to all public access from December 1 to April 15 if wolves are in the Pleasant Valley watershed.

Prohibit sport trapping.

Coordinate with the wolf recovery team regarding new aversion techniques available to landowners in Pleasant Valley.

Use MFWP data and refuge monitoring of deer, elk, and moose populations to determine changes in the natural prey available to wolves on an annual basis.

Evaluate hunting for its effects on prey populations; however, hunting will remain an authorized public use unless determined to be in direct conflict with wolf survival.

Collaborate with the wolf recovery team and MFWP.

Canada Lynx Objectives

Rationales 103–105 are found in appendix H.

- Evaluate proposed management actions in Canada lynx habitats (forests and woodlands) prior to implementation and prohibit sport trapping of furbearers, to minimize negative impacts to Canada lynx habitat, and to prevent accidental death of Canada lynx.
- Identify potential denning and foraging habitat and topographical features important to Canada lynx movement; maintain denning habitat in patches generally larger than 5 acres on at least 25 percent of the denning area above 1,000 meters in elevation; and maintain habitat connectivity; within 10 years of CCP approval, to enhance habitat for lynx.

Strategies

Keep natural fires from spreading off-refuge by creating firebreaks, if necessary, in habitat for Canada lynx.

Evaluate the effects that Canada lynx management would have on other priority species against the probability that lynx would benefit from the management activity or prohibition of such activity.

Identify and designate suitable habitat for snowshoe hare in the vicinity of lynx denning habitat.

Hire a biologist to coordinate and monitor lynx activities.

Clearly post boundaries with appropriate Service signs.

Prohibit sport trapping for the life of this CCP to prevent accidental death of lynx.

Patrol the area using the seasonal law enforcement position for the refuge, staff from the National Bison Range complex, and MFWP wardens.

Determine snowshoe hare populations on the refuge and surrounding lands to evaluate the potential of lynx occupation.

Bald Eagle Objectives

Rationales 107–111 are found in appendix H.

- Annually monitor bald eagle nesting, and protect habitat within 0.5 mile of any occupied bald eagle nest until the bald eagle is delisted and 5 years thereafter, to eliminate disturbance and enhance bald eagle recovery.
- To maximize the potential for nesting of the bald eagles on the north shore of Dahl Lake and the continued existence of nesting bald eagles on the refuge, maintain a mature forest stand comprised of aspen, Douglas-fir, ponderosa pine, or mixed conifers with low to moderate canopy cover, of at least 20 acres within 1 mile of Dahl Lake; the stand will contain at least two suitable nest trees and at least three perch trees.
- Maintain suitable, bald eagle foraging habitat, minimize disturbance within key areas, and maintain the integrity of the breeding area between 0.5 and 1 mile of any occupied eagle nest until the bald eagle is delisted and 5 years thereafter, to enhance bald eagle recovery.
- Remove carrion from roadsides immediately upon notification, limit shooting and trapping, and restrict the use of pesticides; evaluate power lines and reduce associated hazards within 5 years of CCP approval, to minimize direct mortality to bald eagles.

Strategies

Delineate and protect key use areas of bald eagles (foraging and perching) to limit disturbance.

Evaluate all management decisions for their effects bald eagles prior to implementation to ensure that preferred nesting and feeding habitat characteristics are maintained.

Protect bald eagles by evaluating proposed pesticide use before application.

Design habitat alterations to ensure that prey base and important habitat components such as perch trees are maintained or enhanced for the bald eagle.

Monitor the effect on bald eagle use of any recreation permitted in the primary nesting zone.

Design and regulate permanent developments such as viewing areas, trails, parking lots, and kiosks to minimize disturbance and avoid conflict with key use areas for the bald eagle, between 0.5 and 1.0 mile of an active nest.

Hire a biologist to evaluate or facilitate the evaluation of the effects of existing power lines on bald eagles.

Prohibit sport trapping.

Follow the hunt plan (2002) that limits hunting to deer, elk, moose, turkey, and grouse and designates a closed area in which the existing bald eagle nest is located.

Monitor bald eagle nest success to ensure that breeding areas have at least 65 percent nest success, and at least five young fledged during the preceding 5 years.

Monitor occupied bald eagle nest sites to determine fledgling success, using staff or volunteers.

Conduct surveys in a noninvasive manner after the hatching of bald eagle young.

Submit the annual bald eagle nest survey form to the appropriate state authorities.

Trumpeter Swan Objectives

Rationales 116–118 are found in appendix H.

- Annually monitor trumpeter swan migration and nesting in the Pleasant Valley ecosystem, and protect nesting swans on the refuge from human disturbance from time of arrival until cygnets have fledged, to assist in trumpeter swan conservation.
- Reintroduce trumpeter swans to the Fisher River watershed if suitable habitat is available, within 10 years of CCP approval, to restore trumpeter swans to unoccupied, historical breeding habitat and encourage broader winter distribution.

Strategies

Evaluate Dahl Lake's suitability to sustain a healthy, reproducing population of trumpeter swans; evaluate emergent vegetation and aquatic invertebrates in the lake.

Implement the habitat development plan to benefit trumpeter swans: (1) maintain or increase the current amount of emergent vegetation; (2) maintain water depths below 4 feet over extended areas; and (3) maintain stable water levels during the swans breeding season.

Annually compile sightings and habitat use data for trumpeter swans in Pleasant Valley area; coordinate through neighboring landowners, MFWP, PCTC, and USDA Forest Service.

Provide lookouts during the swan migration and nesting season; seek assistance from Flathead Audubon volunteers.

Evaluate threats to swan-nesting success such as snapping turtles, lead shot, and power lines; reduce threats where possible.

Provide relatively disturbance-free swan-nesting areas.

Discourage sedentary swan flocks and prohibit supplementary feeding.

Introduce trumpeter swan cygnets and yearlings to area lakes and wetlands to reestablish nesting trumpeter swans in the Fisher River watershed; collaborate with the Trumpeter Swan Working Group and CSKT.

Limit public access in the trumpeter swan-nesting area, depending on nest site location.

Use signs to post trumpeter swan-nesting areas closed to public use; develop interpretive material to explain closures.

Monitor for trumpeter swans during routine duties including duck pair and brood counts.

Develop monitoring protocols for trumpeter swan restoration efforts.

Black Tern Objectives

Rationale 121 is found in appendix H.

- Annually monitor the number of nesting black terns, and monitor the tern's nesting and foraging habitat through the period of wetland restoration and enhancement to determine if emergent vegetation is provided at levels and densities equivalent to or above current levels (80 acres of palustrine, emergent, semipermanent, and flooded vegetation), with a water-to-emergent-vegetation ratio between 25 and 75 percent (as close to 50 percent as possible), and water depths between 0.5 and 1.2 meters at the emergent-vegetation/open-water interface, to establish baseline data for management decisions, and contribute to statewide conservation of black terns.

Strategies

Ensure refuge-specific data about black terns are included in statewide information; coordinate through MFWP.

Survey for presence, abundance, and nesting activity of black terns on Dahl Lake to determine the nesting population associated with current levels of emergent vegetation.

Monitor for number of black tern adults present, number of nests, and nest success through the use of volunteers, interns, or refuge staff.

Monitor black tern nesting response to changes in water levels of Dahl Lake during implementation of the habitat development plan and other management activities.

Determine the effects of wetland development on black tern habitat by doing pre- and postactivity

measurements of vegetation response and water depth in emergent-vegetation areas adjacent to open water; map acreages of emergent vegetation and open water in GIS.

Boreal Toad Objectives

Rationale 124 is found in appendix H.

- Assess the impacts that implementing the habitat development plan would have on the boreal toad population prior to wetland manipulation in those areas documented in 2001–2003 as breeding areas for this species.

Strategies

Locate breeding sites for boreal toads (Hossack et al. 2001).

Cross reference boreal toad sites against the habitat development plan to determine needed changes.

Determine methods of wetland restoration and management that have the least adverse effect on boreal toads.

Document the response of boreal toads to revegetation and restoration of Pleasant Valley Creek; continue collaborative project with USGS' Amphibian and Reptile Monitoring Initiative.

Determine what effects implementing the habitat development plan may have on the boreal toad, in collaboration with amphibian and reptile biologists.

Spalding's Catchfly Objectives

Rationale 125 is found in appendix H.

- Maintain Spalding's catchfly populations in suitable upland grasslands (minimum population of 350 plants), and inventory 10 percent of suitable habitat each year until all suitable habitat has been evaluated, to protect Spalding's catchfly and provide unique opportunities for visitors to learn about threatened plants.
- Inventory for Spalding's catchfly prior to any management actions to prevent destruction of Spalding's catchfly plants or adverse modification of its habitat.
- Annually control invasive plants around any Spalding's catchfly population that has a minimum of 20 plants, until survey shows there are no invasive plants within a 100-meter buffer, to maintain and increase Spalding's catchfly populations.

Strategies

Inventory all suitable habitat within the legislative boundary of the refuge for the presence of Spalding's catchfly.

Locate and map sites of Spalding's catchfly using global position system (GPS) technology.

Search suitable habitat for Spalding's catchfly plants using volunteers from local schools and the Montana Native Plant Society, and Landmark Volunteers.

Establish a list of volunteers that are willing to help inventory for Spalding's catchfly or control invasive plants in catchfly habitat.

Report locations of Spalding's catchfly populations to the Montana Natural Heritage Program.

Conduct site evaluations for habitat characteristics of Spalding's catchfly to better manage present and other potential sites of suitable habitat.

Evaluate short-term, long-term, and cumulative effects of management actions (e.g., invasive plant control and prescribed fire) on maintenance and restoration of Spalding's catchfly.

Maintain a robust native plant community using prescribed fire.

Coordinate and collaborate with Montana DNRC to maintain Spalding's catchfly plants.

Maintain native Palouse prairie habitat in and around the Spalding's catchfly site with sufficient native forb composition to attract, but not compete for, pollinators.

Protect Spalding's catchfly sites from trampling and grazing.

Monitor all Spalding's catchfly populations on the refuge to determine population trend.

Monitor Spalding's catchfly from mid- to late July when flowers are in bloom using walk-through surveys.

Monitor Spalding's catchfly sites for insect damage and apply adaptive management to protect plants.

Map invasive plant populations within and around all Spalding's catchfly populations.

CULTURAL RESOURCES

Archaeological and historical resources, as well as traditional uses, are addressed in the management direction for cultural resources.

GOAL

Protect, manage, and interpret archaeological, cultural, and historical resources present at Lost Trail National Wildlife Refuge for the benefit of present and future generations.

Cultural Resources Objectives

The basis for the following objectives and strategies is described in rationales 126–129, found in appendix H.

- To preserve resources for all Americans and comply with applicable laws and legislation,

maintain and protect documented cultural and historical resources.

- Survey all refuge lands for cultural resources, within 15 years of CCP approval, to preserve resources for all Americans and comply with applicable laws and legislation.
- Develop an outreach program to educate the public about cultural and historical aspects of the refuge and foster support and understanding of the management program to protect sensitive aspects of these resources, within 5 years of CCP approval.

Strategies

Survey for cultural resources before doing developments and restoration activities.

Use the most up-to-date techniques for surveying, documentation, preservation, restoration, and research through coordination with region 6's archaeologists, Montana State Historical Preservation Office, the CSKT THPO, and local scholars and experts.

Provide one full-time public use specialist to be trained to conduct and coordinate formal cultural surveys.

Accommodate access to and ceremonial use of sacred sites by religious practitioners of recognized Native American tribes in accordance with policy.

Develop a resource library of information about cultural and historical sites on the refuge.

Develop programs for the public to experience cultural resources with limited direct contact, e.g., access to photographs and replicas vs. actual site visits.

Work with region 6's archaeologist and education and visitor services staff to develop interpretive and educational products.

Provide one full-time law enforcement officer to enforce laws and regulations to protect cultural resources.

Provide one full-time and one part-time maintenance staff to prevent damage and deterioration of resources.

Work with region 6's archaeologist to develop and perform a formal review of documented resources every 5 years to ensure protection, evaluation of condition, and preservation.

Dispense outreach materials for cultural resources in partnership with local schools, colleges, and civic groups.

PUBLIC USE

Priority public uses (wildlife-dependent recreational uses) are addressed in the following management direction for public use. Priority uses are listed here:

- hunting
- fishing
- wildlife observation
- wildlife photography
- interpretation
- environmental education

The definition of authorized access (foot travel, snowshoes, skis, mountain bikes, horses) will be determined in the appropriate step-down plan(s).

GOAL

Provide quality wildlife-dependent recreational and educational opportunities for persons of all abilities to learn, understand, and enjoy the Intermountain ecosystem of northwestern Montana; its associated fish, wildlife, and plants of Lost Trail National Wildlife Refuge; and the National Wildlife Refuge System in a safe and compatible manner.

Public Use Objectives

Locations of public use and facilities are displayed in figure 12.

The basis for the following objectives and strategies is described in rationales 131–134, found in appendix H.

General Objectives

- Develop a demographic profile of wildlife-dependent recreational users (users within a 2-hour commuting radius) within 2 years of CCP approval, to determine the long-term direction to provide for quality, public use opportunities.
- Develop and implement a visitor service plan within 2 years of CCP approval, to provide the highest quality wildlife-dependent recreational opportunities.
- Develop one accessible day use area within 3 years of CCP approval, to encourage participation in wildlife-dependent use opportunities, which will foster appreciation and support for fish, wildlife, and their habitat.
- To reduce disturbance and increase nest success probability, site-specific management activities or public use activities will not be permitted within 0.5-mile of any occupied golden eagle nest.

Strategies

Collaborate with region 6's staff in education and visitor services (EVS).

Provide one full-time public use specialist to work with EVS staff and the Office of Management and Budget to develop a demographic profile of current and future refuge visitors.

Request design assistance from the National Center on Accessibility, the Summit Independent Living Center, and other groups to ensure that sites are accessible for all users.

Develop partnerships with local angler and hunting groups such as Trout Unlimited, Ducks Unlimited, and RMEF to learn of fishing and hunting use in the area, access needs, and sport fishery and hunting goals.

Evaluate proposed changes in public access prior to implementation; monitor for effects related to the grizzly bear if access is approved.

Limit public access in trumpeter swan-nesting areas, depending on nest site location.

Incorporate suspension provisions into special-use permits for the presence of grizzly bears.

Incorporate suspension provisions into special-use permits for the presence of wolves.

Allow high-intensity activities outside the nesting season for bald eagles.

Allow existing levels of human activity if the bald eagle breeding area has at least 65 percent nest success, and has fledged at least five young during the preceding 5 years.

Limit disturbance to bald eagles by restricting construction of permanent developments such as kiosks, parking areas, and trails that may increase human activity within 0.5 mile of an occupied bald eagle nest or area with prime nesting potential.

Limit human activity in key bald eagle areas.

Provide one full-time law enforcement officer to contact the public, educate about and enforce ethical standards, and enforce rules and regulations.

Erect standard refuge entrance signs at entries along main roads.

Design and develop facilities to meet accessibility standards in coordination with region 6's EVS staff.

Ensure that sites are accessible for all users; request design assistance from the National Center on Accessibility, the Summit Independent Living Center, and other groups.

Develop one either-sex accessible restroom facility to be available during daylight hours.

Provide a source of drinkable water available during daylight hours.

Erect and maintain at least three accessible kiosks with maps, rules and regulations, and wildlife-dependent recreational opportunities (figure 12).

Develop an accessible day use area with six tables and fire pits.

Develop an accessible campground for 35 students and educators, with drinkable water and restroom facilities.

Provide one full-time and one half-time maintenance staff to construct and maintain public use facilities and areas.

Open the headquarters/contact station to the public a minimum of 5 days a week, including weekends during peak use (e.g., hunting season).

Provide one full-time public use specialist to recruit volunteers to staff the contact station to allow for minimum and increased operation.

Provide one half-time clerk to staff the contact station and dispense information.

Conduct a formal visitor services requirement evaluation with region 6's EVS staff to determine if the visitor service plan has been met and to determine future needs.

Obtain information on wildlife-dependent recreational users visiting the area, in coordination with MFWP, Flathead County Travel Board, Kalispell and Libby Chambers of Commerce, and the Institute for Tourism and Recreation Research (University of Montana).

Hunting Objectives

Rationales 141–144 are found in appendix H.

- Allow elk, deer, mountain grouse, and turkey hunting under MFWP regulations, starting fall 2002 in designated areas (appendix F); and provide a quality hunting experience to persons of all abilities within 5 years of hunt plan approval, resulting in at least 90 percent of hunters reporting a quality hunt, to provide quality opportunities for persons of all abilities to take part in hunting.
- Provide special youth-only hunts for deer and elk, during the first week of archery season and the first week of rifle season, starting fall 2002 to promote understanding, appreciation, and stewardship of the refuge and all system lands.
- Provide easily accessible information to and personal contact with hunters for at least 95 percent compliance with refuge regulations, within 5 years of CCP approval, to encourage hunters to practice the highest standards of ethical behavior in attempts at taking wildlife.

Strategies

Allow hunters access to portions of the refuge that would provide reasonable challenges and opportunities for taking targeted species under the described harvest objective and create minimal conflict with other priority wildlife-dependent recreational uses or refuge operations (appendix F).

Post and distribute refuge regulations prohibiting trapping to prevent accidental death of Canada lynx.

Make staff available at the contact station to provide rules, regulations, information, and first aid to hunters daily during the opening and closing weeks of archery and rifle seasons, and during weekends throughout hunting season. Staffing would be recruited from the National Bison Range complex, as well as volunteers.

Provide one full-time law enforcement officer to be available in the field during hunting season to inform hunters of rules, regulations, and ethical behavior.

Provide adequate law enforcement staffing during peak hunting periods, in collaboration with MFWP.

Erect appropriate signs to designate closed and restricted areas to reduce the chance of noncompliance and conflicts with nonhunters.

Inform hunters with disabilities (who have obtained a MFWP permit to hunt from a vehicle) about opportunities to access designated refuge management roads and trails, in collaboration with MFWP.

Provide information about opportunities on surrounding lands to allow hunters to plan for a quality experience, in collaboration with PCTC, Flathead National Forest, and MFWP.

Designate the first week of archery season and the first week of rifle season as youth-only hunts for hunters 12–14 years of age, accompanied by an adult at least 21 years of age.

Make law enforcement and other staff available during the youth hunts to provide a positive hunting experience and promote ethical hunting behavior; include volunteers and MFWP personnel, as well as one full-time, refuge, law enforcement officer.

Develop and implement a monitoring system to receive input from hunters about their hunting experiences using direct interviews, registration stations at parking areas and trailheads, and mail-in/drop-off cards left on vehicles, working with region 6's EVS staff and the Office of Management and Budget.

Annually monitor and evaluate the presence of boundary hunting adjacent to closed areas of the refuge. If necessary to discourage this practice, consider these actions: (1) alter hunt area boundaries

or habitat; and (2) eliminate parking areas and access roads—to distribute hunters or modify wildlife use patterns in ways that make boundary hunting less appealing.

Obtain information on hunting use in the area, access needs, and hunting goals, in coordination with local hunting groups such as Ducks Unlimited and RMEF.

Evaluate hunting for its impacts on prey populations for the gray wolf; continue to authorize hunting unless it is determined to be in direct conflict with gray wolf survival.

Fishing Objectives

Rationales 145–146 are found in appendix H.

- Determine, within 5 years of CCP approval, the feasibility of restoration of native sport fisheries, to address a previously unavailable use opportunity.
- Carry out planning, funding, evaluation, and implementation of a restoration program for native fisheries—through at least four partnerships—within 5 years of determining a native sports fisheries is feasible, to develop quality, sport-fishing opportunities.
- Open at least 30 percent of fishable waters along Pleasant Valley Creek and Dahl Lake, with a minimum of one accessible fishing area that provides safe and uncrowded fishing opportunities, within 2 years of restoring a viable sport fishery if determined feasible, to provide a quality fishing experience.
- Provide one fishing event for youth per year, involving at least 20 participants, within 2 years of hiring a public use employee, to increase youth appreciation of fish and fishing.

Strategies

Gather baseline resource data, review literature, and develop and implement restoration plans, in collaboration with NRCS, Trout Unlimited, MFWP, and USGS.

Provide one full-time biologist to coordinate refuge participation in sport-fishing partnerships.

Design, develop, and maintain parking areas, trails, and accessible fishing platforms to provide access and protect resources. Pursue funding sources such as partnerships, grants, and fee programs.

Provide one full-time public use specialist and one half-time park ranger to coordinate and conduct the fishing program for youth. Pursue funding sources such as partnerships, grants, and fee programs.

Provide one full-time public use specialist to provide and monitor quality fishing opportunities.

Provide one full-time law enforcement officer to contact anglers and enforce rules and regulations.

Develop informational handouts (tear sheets) with a map, access points, rules, and regulations; handouts will be available at kiosks. Open and closed areas to fishing will be clearly signed.

Collaborate with off-refuge youth fishing programs (such as MFWP, Hooked on Fishing, and Creston National Fish and Wildlife Center) and recruit community volunteers to help with events held at appropriate fishing sites off the refuge.

To attract more participants and provide more educational opportunities, conduct the youth fishing program during National Fishing Week (early June).

Work with youth programs such as Girl Scouts, Boy Scouts, and schools to encourage a broad spectrum of fishing event participation.

Develop a system to monitor the quality of fishing experiences using comment cards, personal contacts, and registration at fishing sites, working with the Service's region 6 EVS staff.

Obtain information on fishing use in the area, access needs, and sport fishery goals, in coordination with local angler groups such as Trout Unlimited.

Wildlife Observation and Photography Objectives

Rationales 148–152 are found in appendix H.

- Provide opportunities for wildlife observation and photography by providing public access with minimal disturbance to wildlife and habitat, and developing designated viewing sites (one wildlife drive, two accessible wildlife-viewing areas, and one accessible trail), resulting in a 90 percent visitor satisfaction rate within 5 years of CCP approval, to promote public appreciation of natural and cultural resources.
- Make contact with 90 percent of visitors via the visitor contact station, interpretive materials, and interpretive kiosks, starting within 2 years of CCP approval, to provide quality wildlife observation and photography opportunities, and promote public appreciation of natural and cultural resources.
- Encourage the highest standards of ethical behavior by the public during wildlife observation and photography, with 90 percent of visitors understanding and following procedures within 5 years of CCP approval, to provide quality wildlife observation and photography opportunities and limit resource damage.

Strategies

Instill ethical observation and photography behavior through presentations, workshops, and field trips, in collaboration with local outdoor groups such as the Flathead Chapter of the Audubon Society, Boy Scouts, and Girl Scouts.

Provide one full-time biologist work to work with MFWP and NRCS to gather data on wildlife and plants for development of species lists.

Provide one full-time public use specialist to work with the Service's region 6 EVS staff to design, develop, and monitor the program for wildlife observation and photography.

Develop one wildlife drive, one accessible wildlife-viewing area, one accessible trail, and one foot trail in areas that would provide observation and photography opportunities while minimizing disturbance to natural resources (figure 12).

Erect and maintain at least three accessible kiosks with maps, rules, and regulations. Post the best, current observational and photographic opportunities for wildlife (figure 12). Provide maintenance personnel to build and maintain kiosks.

Develop materials about wildlife-dependent recreational use allowed on the refuge, including rules and regulations; post at the contact station and at all kiosks, pullouts, and trailheads; include information to encourage ethical behavior among users.

The area between the county road and the South Pleasant Valley Road (figure 12) will be open to authorized public use only on designated trails and roads from May 15 to September 1 and December 15 to April 1. It will be open to authorized public use on and off trails from April 1 to May 15. It is closed to all public access from September 1 to December 15.

Uplands (figure 12) will be open to authorized public use only on designated trails and roads from December 15 to April 1 and will be open to public use on and off trails for the remainder of the year.

Monitor the wildlife observation and photography program with observation of visitor use, comment cards, car counters, personal contacts, review of law enforcement incidents, and tracking of wildlife movements and resource damage.

Develop partnerships with local wildlife groups such as Flathead Chapter of the Audubon Society and photography clubs to gather information on member use of local wildland areas for wildlife observation and photography.

Coordinate with local schools, Girl Scouts, Boy Scouts, MCC, and other youth groups to build viewing sites while providing an educational experience for youth.

Develop and distribute public use surveys to determine quality of observation and photography experiences.

Gather information on member use of local wildland areas for wildlife observation and photography, in collaboration with local groups such as the Flathead

Chapter of the Audubon Society and photography clubs.

Interpretation Objectives

Rationales 158–160 are found in appendix H.

- Develop interpretive materials and disseminate them to at least 90 percent of visitors, within 2 years of program funding and staffing to promote public appreciation of natural and cultural resources.
- Develop interpretive themes within 10 years of hiring a public use specialist. Major themes will include wetlands, endangered species, history of Pleasant Valley, management of Lost Trail National Wildlife Refuge, the National Wildlife Refuge System, and the Service, to increase visitors' understanding and support, as well as their appreciation of fish, wildlife, plants, and their habitats.
- Ensure that at least 75 percent of visitors understand wetland values and the refuge's contribution to restoration and protection of Pleasant Valley wetlands, within 5 years of CCP approval, to promote public appreciation of natural resources.

Strategies

Interpret the mission of the refuge, the National Wildlife Refuge System, and the Service through direct contact of staff with visitors.

Request design assistance from the National Center on Accessibility, the Summit Independent Living Center, and other groups to develop interpretive materials.

Provide one full-time public use specialist to work with region 6 EVS staff to develop a station brochure and handouts.

Distribute outreach materials for cultural resources in collaboration with local schools, colleges, and civic groups.

Erect and distribute interpretive signs and materials at parking areas, wildlife-viewing areas, trailheads, and the contact station.

Develop a public use brochure with a clear map, wildlife-dependent recreational opportunities, rules, and regulations; make brochure available at accessible points within 2 years (figure 12).

Design and develop interpretive displays for the contact station, working with the Service's region 6 EVS staff.

Provide one full-time maintenance staff to build and maintain the wildlife-viewing area and trails.

Develop interpretive materials about wetland restoration within 2 years, in partnership with NRCS.

Coordinate with local schools, Girl Scouts, Boy Scouts, MCC, and other youth groups to build interpretive nature trails while providing an educational experience for youth.

Develop interpretive materials about management of the refuge, the national wildlife Refuge System, and the Service.

Develop an interpretive handout with tips for ethical viewing behavior and the advantages of following them, i.e., less disturbance to wildlife provides more viewing opportunities.

Provide one half-time clerk to staff the contact station and dispense information.

Develop interpretive materials about the history of Pleasant Valley, in collaboration with the CSKT, local history groups, and neighbors.

Provide one full-time public use specialist to develop cultural resource materials to dispense to the public.

Provide one full-time public use specialist to work with region 6's EVS Staff and NRCS to design and develop interpretive displays about wetlands to be erected at the Dahl Lake wildlife-viewing area, along interpretive trails, and at the contact station (figure 12).

Use signs to post areas closed to the public during use by trumpeter swans; develop interpretive material to explain closures for swans.

Provide one public use specialist to work with region 6's EVS staff to develop a handout with observational and photographic and observational opportunities along with successful techniques a comprehensive map, rules, and regulations.

Educate the public on how to minimize winter disturbance and stress to large mammals during recreational activities.

Develop interpretive materials about endangered species, working with region 6's ecological services staff.

Develop an outreach program for the public on the grizzly bear and recovery efforts, to develop better support for and understanding of the species and to minimize adverse human actions and conflicts. Work with the interpretation and education subcommittee of the Interagency Grizzly Bear Committee.

Use letters, phone calls, informational meetings, and door-to-door visits to educate and inform the public on the progress of wolf recovery and the development of livestock protection methods.

Develop an interpretive panel about wolves to be displayed in the visitor contact station or at a kiosk.

Develop interpretive material about Spalding's catchfly to educate the public on identification of the

plant, habitat requirements, and why the plant is endangered.

Develop an interpretive display to post at the contact station, kiosks, parking areas, and trailheads to inform users of ethical behavior.

Produce and distribute a tear sheet with a map that designates areas open and closed to hunting, along with all pertinent rules, regulations, and restrictions so hunters can make informed decisions (appendix F).

Develop media contacts and outreach materials to inform the hunting community of hunting opportunities for youth.

Erect interpretive displays at designated parking areas (figure 12) and at the contact station that describe ways to hunt ethically and explain hunting rules, regulations, and restrictions.

Monitor interpretive services and messages through feedback from visitors—observation of visitor’s use and personal contacts, comment cards, car counters, law enforcement incidents, and registration at kiosks, observation sites, parking areas, contact stations, and trailheads.

Environmental Education Objectives

Rationales 161–166 are found in appendix H.

- Develop an extensive environmental education program, including development of a formal partnership, within 5 years of CCP approval, to allow students and educators to gain hands-on experiences and appreciation of natural resources.
- Develop and maintain a lending library of extensive materials and resources within 2 years of CCP approval, to provide up-to-date and Service-related environmental education materials for educators.
- Provide on-site field trips to educators and students upon request to foster stewardship of the land, understand the refuge mission of conserving natural resources, and experience the wonder of native fish, wildlife, and plants as well as the culture and history of the area.
- Develop an accessible campground for overnight use by educational groups, within 1 year of implementation of an environmental education program, to allow students and educators to gain hands-on experience and appreciation of natural resources.

Strategies

Determine environmental educational needs and student numbers within a 2-hour travel radius through collaboration with local schools, including

Flathead Valley Community College and the University of Montana’s Yellow Bay Biological Station.

Develop an environmental education manual that fulfills both the educational requirements of local and nearby students and the vision and goals of the refuge. Work closely with Pleasant Valley and Marion school districts.

Develop refuge-specific curriculum, lesson plans, and activity guides that complement school curricula and use the refuge as a living laboratory, in collaboration with local schools and region 6’s EVS staff.

Promote hunter education for youth by providing educational materials and outdoor education sites, in collaboration with MFWP.

Become a member of the Environmental Education Core Group, a coalition of local individuals and groups (private and governmental) involved in environmental education.

Provide one full-time public use specialist to develop, implement, and monitor the environmental education program.

Provide one career-seasonal park ranger to support the environmental education program.

Provide training to environmental education staff at least once a year to attain the knowledge, skills, and abilities to support environmental education at a minimum level.

Recruit and train volunteers to assist in developing and presenting environmental education programs.

Work with the region 6’s EVS staff to design the campground to meet accessibility standards.

Provide one full-time public use specialist to coordinate campground use with environmental education activities, organize a reservation system for qualified groups, and monitor the site during use.

Pursue grants that would allow schools to participate in environmental education at the refuge, in coordination with the school boards of Pleasant Valley and Marion schools.

Provide in-school materials to orient students prior to field trips to convey safety messages and describe appropriate field conduct to minimize resource damage.

Develop and present teacher workshops; obtain provider status from the Montana State Office of Public Instruction.

Provide information sheets and wolf education boxes to schools.

Develop a program to be presented to local schools on wolves, their biology, and their importance in the ecosystem.

Conduct at least one field trip or environmental education activity per year in collaboration with the Pleasant Valley and Marion schools to aid in students' biology education.

Conduct at least one hands-on project per year for biology student in collaboration with the Montana Academy to aid in students' biology education, as well as benefit refuge resources.

Work with MFWP, Glacier National Park, Flathead National Forest, and the CSKT to determine what they offer and whom they serve.

Work with local environmental education groups, including Flathead Chapter of the Audubon Society, Glacier Institute, Swan Ecosystem Center, and Crown of the Continent Ecosystem Education Consortium to determine what they offer and whom they serve.

Select and develop a designated environmental education site (figure 12), working with region 6's EVS staff and the National Center on Accessibility.

Research and obtain materials relevant to natural and cultural resources of the refuge and Pleasant Valley.

Develop and gather environmental education materials, working with region 6's EVS staff and the Service's National Conservation Training Center (NCTC), division of educational outreach.

Establish formal partnerships with school districts and community groups to assist with development, implementation, and promotion of the library.

Provide one full-time public use specialist to develop, organize, maintain, and distribute library materials.

Create a nonprofit group to support environmental education and research at the refuge, in coordination with the Montana State University extension office (Flathead County).

Develop on-site monitoring and research programs for students and educators with an emphasis on wildlife conservation and the importance of wetlands, working with the refuge's biology staff and the NRCS.

Develop partnerships with local schools, Girl Scout, Boy Scouts, the MCC, and other youth groups to provide an educational experience through participation in fence removal, facility maintenance, and other habitat management projects.

Seek assistance from the Montana Academy staff in areas that may be beneficial to the refuge as well as to students (e.g., tansy ragwort control).

Monitor the overall effectiveness of the environmental education program by tracking the number of teachers, students, and groups using the resources, and by providing feedback forms to educators.

ADMINISTRATION

Organizational structure, staffing, facilities, equipment, and maintenance are administrative items addressed in the management direction.

GOAL

Provide staffing, funding, and facilities to maintain the long-term integrity of habitats and wildlife resources of Lost Trail National Wildlife Refuge in supporting the achievement of ecosystem and National Wildlife Refuge System goals.

Administration Objectives

The basis for the following objectives and strategies is described in rationales in appendix H.

Operations Objectives

Rationales 169–178 are found in appendix H.

- Form a new complex comprised of Lost Trail National Wildlife Refuge, Swan River National Wildlife Refuge, and Flathead County units of the Northwest Montana WMD, separate from the National Bison Range complex, within 15 years of CCP approval, to better address interests unique to this area of northwestern Montana and anticipated increased public use.
- Provide adequate resources and staff to administer, develop, and maintain refuge habitat, facilities, programs, and public use for the period of this CCP, within 2 years of CCP approval, to perform the restoration, management, activities, and monitoring described in the CCP to achieve the refuge's goals
- Provide on-site law enforcement (overt, covert, and preventative) within 1 year of CCP approval, to provide quality public use experiences, while ensuring the protection of refuge resources.
- Annually use volunteers to assist with maintenance, biological monitoring, and public use activities to effectively and efficiently implement the CCP.

Strategies

Provide a separate organizational code and appropriations, by the Service's region 6 office, for future operations, maintenance, and administration of the refuge.

Transfer the annual funding for the National Bison Range, for one full-time employee for the on-site supervisory refuge operations specialist, to the reorganized refuge complex.

Recruit one supervisory refuge operations specialist (GS-12) to provide management operations, oversight, and administration for the refuge and other Service units north of the refuge.

Maintain the on-site, full-time refuge manager (GS-11, supervisory refuge operations specialist) to provide daily supervision and oversight to all activities and operations.

Recruit one maintenance worker (WG-8) to provide adequate resources to operate, maintain, and repair facilities.

Develop a web page to describe available maintenance resources and to monitor and track materials.

Recruit one full-time wildlife biologist (GS-11) to be stationed at the refuge for coordination of the biological program.

Hire one full-time biological technician (GS-9) to assist in habitat management, and habitat and facility maintenance.

Hire one public use specialist (GS-11) to coordinate the public use program and facilities.

Hire one full-time administrative support assistant (GS-4/5) to provide daily on-site clerical and administrative support.

Coordinate and plan equipment needs with the maintenance supervisor and project leader at complex headquarters through the refuge operating needs system (RONS) and maintenance management system (MMS) processes, to acquire appropriate equipment to maintain facilities and habitats (e.g., tractor, mower, backhoe, pickup, dump truck, motor boat, vehicle hoist, equipment repair tools and diagnostics, and carpentry tools and machinery).

Maintain equipment in a safe and efficient operating status.

Replace and add equipment through the RONS planning process as needed (due to normal deterioration and needed repair, and as staffing is increased).

Acquire necessary office equipment including computers and Internet access.

Provide microscopes and lab and other necessary equipment to support the environmental education curriculum.

Provide field guides, binoculars, and spotting scopes to assist with census work.

Provide VCRs, televisions, and slide projectors to preview audiovisual materials.

Provide satellite capacity for the Service's "distance from learning" program.

Communicate with MFWP staff to maintain adequate levels of law enforcement on and adjacent to the refuge.

Provide one full-time law enforcement officer to protect natural and cultural resources by coordinating with MFWP.

Provide the necessary office equipment and space to such partners as a "friends group."

Facilities Objectives

Rationales 186–189 are found in appendix H.

- Provide adequate administrative and maintenance facilities within 3 years of CCP approval, and ensure needed facilities and structures are maintained to Service standards during the period of this CCP, to provide support for refuge staff and programs, and for public safety.
- Identify and remove unnecessary structures and facilities within 10 years of CCP approval, to provide for restoration of habitat, protection of wildlife, reduction of maintenance needs, and public safety.

Strategies

Modify the horse arena to provide administrative space, a maintenance shop, and equipment storage; submit as a RONS project to modify the building and acquire equipment and tools including a phone system, computers, work stations, filing and storage cabinets, a vehicle lift, a vehicle wash bay, equipment repair tools, carpentry tools, and metal working tools.

Coordinate with Flathead Wildlife, Inc. to assist with building parking areas for designated public use activities and assist with habitat management projects.

Work with the Service's region 6 staff (education and visitor services) on design and accessibility requirements.

Develop a recreational vehicle trailer site to support a volunteer program.

Repair and maintain facilities, buildings, fences, and roads on an "as-needed basis."

Develop and implement a RONS and MMS projects list to provide necessary public use-dependent equipment and facilities.

Coordinate with the PCTC where shared-easement road maintenance is applicable.

Remove unnecessary facilities and structures including interior fences, east cattle station structures, guest cottage building, ranch office building, and feedlot corrals.

Complete facility maintenance and fence removal through assistance from the MCC and Landmark Volunteers.

Continue the annual fence removal project (RMEF challenge cost-share grant initiated in 2000).

Recruit volunteers for projects such as removal of the east cattle station, clean up or removal of other facilities, monitoring, and public use activities.

Operate under the statewide agreement with the Montana DNRC for fire suppression on the refuge.

Determine how to minimize any negative effects resulting from modifications to refuge portions of Pleasant Valley Creek on native fisheries downstream in Fisher River, through collaboration with MFWP and NRCS.

Coordinate fire suppression issues and protocols at annual meetings with Montana DNRC.

Continue coordination with PCTC regarding maintenance of existing fence lines.

Control beaver activities that impact Pleasant Valley Road, i.e., flooding, through coordination with MFWP.

Issue a special-use permit to the USDA Forest Service for use of road 1019 for the purpose of logging activities on land north of the refuge.

Continue to abide by rules and agreements in the existing power-line easement document. Annually review the easement document and coordinate all refuge activities that may affect the power line with Bonneville Power Administration.

PARTNERSHIPS

Partnerships that support overall management of the refuge are addressed in this management direction. Partnerships for single-type or localized activities have been described in the above topics.

GOAL

Promote and develop partnerships with adjacent landowners, public and private organizations, and other interested individuals to preserve, restore, and enhance a diverse and productive ecosystem of which Lost Trail National Wildlife Refuge is an integral part.

Partnership Objectives

The basis for the following objectives and strategies is described in rationales 192–201, found in appendix H.

- Meet once a year with the NRCS and private landowners in the Pleasant Valley to coordinate and collaborate on an interagency, land steward partnership to protect more than 5,800 acres of wetland and wetland-related habitat, within 3 years of CCP approval.

- Partner with nongovernmental organizations (RMEF, Audubon Society, Landmark Volunteers, MCC, and Flathead Wildlife, Inc.) to conduct habitat and maintenance activities and collect biological data for the first 5 years after CCP approval, to increase conservation efforts.
- Develop a “friends group” for a mutually agreed-upon area of the refuge within 3 years of CCP approval, to enhance management, programs, or funding of refuge programs.
- In conjunction with PCTC; MFWP; Montana DNRC; USDA Forest Service; and private landowners, determine the opportunities and feasibility for a forest legacy easement within 5 years of CCP approval.
- Share law enforcement responsibilities with MFWP during deer, elk, and upland game bird hunting seasons, on and adjacent to the refuge, for the duration of this CCP, to efficiently provide quality public use experiences, while ensuring the protection of refuge resources. Coordinate with the local sheriff’s office and the Montana Highway Patrol to address and deal with potential issues outside of the hunting season and to provide law enforcement personnel with backup and law enforcement assistance when needed.
- Meet once a year with PCTC, RMEF, Flathead and Lincoln counties weed departments, and the USDA Forest Service to maintain partnerships for collaboration and mutual assistance with invasive plant control, access, and road maintenance issues, for the period of this CCP.
- For the period of this CCP, collaborate with the Flathead County Road Department regarding refuge signage and potential cooperative road maintenance and possible relocation issues concerning Pleasant Valley Road.
- Continue issuing annual special-use permits with the USDA Forest Service for use, maintenance, and invasive plant control on refuge road North 1019, as needed for the period of this CCP.
- Continue coordination with Bonneville Power Administration regarding the power line easement for the duration of this CCP.
- Maintain the statewide memorandum of understanding with the Department of Natural Resource Conservation for wildland-fire suppression efforts for 15 after CCP approval.
- For the period of this CCP, continue coordination with PCTC and their lessee regarding grazing issues on adjacent PCTC lands.

Strategies

Collaborate with Partners for Fish and Wildlife to continue restoration on the refuge and adjacent lands.

Work with the Flathead County extension office to develop a “friends group” and a direction of focus.

Provide one three-quarters-time volunteer coordinator to implement the “friends program.”

Coordinate closely with the NRCS on stream and wetland restoration throughout the WRP.

Collaborate with USGS, Northern Rocky Science Center, on management of wetlands.

Coordinate protection of species of concern with conservation easement partners such as the NRCS WRP, MFWP, Montana Land Reliance, The Nature Conservancy, and Audubon Society.

Seek partners and volunteers to design and fund methods, and assist in determining production of waterfowl.

Share the expense and workload of aerial pair and brood counts for waterfowl with MFWP; Avista Utilities; and the CSKT.

Seek partners such as MFWP, PCTC, Defenders of Wildlife, Flathead and Kootenai National Forests, and the Great Bear Foundation, for grizzly bear conservation.

Coordinate and collaborate with Montana DNRC to maintain Spalding’s catchfly.

Meet with “friends group” volunteers at least twice a year to determine group direction and assist where appropriate.

Use students to assist with fence removal or various other habitat management projects.

Maintain adequate levels of law enforcement assistance on or adjacent to the refuge during hunting seasons for big game and upland game birds through continued communication with MFWP.

Provide one full-time law enforcement officer to protect natural resources by coordinating with MFWP.



Students from Pleasant Valley School work with goose nesting structures at the refuge.

Ray Washiak/USFWS

ALTERNATIVE B

Manipulated habitats maximize use by huntable and watchable birds and mammals, and sport fisheries.

Maximum, compatible public use occurs.

Staffing is minimal, with additional law enforcement. Visitors have quality experiences at developed facilities.

Partnerships accomplish habitat management and foster conservation.

RIPARIAN HABITAT

Stream channels and associated vegetation are addressed in the management direction for riparian habitat. Water control structures that affect the functioning of riparian habitat, as well as fish passage, are addressed.

GOAL

Restore, enhance, and maintain a mixed deciduous and coniferous riparian habitat to support indigenous wildlife species and perpetuate the ecological integrity of the Fisher River watershed.

Riparian Habitat Objectives

The basis for the following objectives and strategies is described in rationales 1–6, found in appendix H.

- The Service will maintain coordination and collaboration for restoration of the stream vegetation and stream meander on the WRP easement...*as in alternative A*
- Inventory and evaluate willow, alder, and birch vegetation...*as in alternative A*
- Restore stream bank vegetation (willow, alder, hawthorn)...*as in alternative A*
- Enhance the integrity of the Pleasant Valley Creek restoration project with fish passage...*as in alternative A*
- Maintain, and increase when feasible, quaking aspen...*as in alternative A*
- Evaluate feasibility, within 2 years of CCP approval, of restoration of Pleasant Valley Creek to a level that can sustain catch-and-release native trout fisheries, to restore native redband and westslope cutthroat trout fisheries and increase fishing opportunities.

Strategies

Study stream characteristics and the biological potential of Pleasant Valley Creek, in collaboration with NRCS, MFWP, and Trout Unlimited.

Develop plans for restoration of channel meander and stream vegetation of Pleasant Valley Creek within the refuge, in collaboration with NRCS, MFWP, and Trout Unlimited.

Excavate natural channel meander back into Pleasant Valley Creek.

Revegetate the north section of Pleasant Valley Creek where alders have died and channel meander is being restored at Lower Moose Pond, in collaboration with NRCS.

Manage riparian areas and willow stands to maintain or achieve midaged condition or higher in areas above 3,300 feet elevation for lynx habitat.

Evaluate the two water control structures from the north section of Pleasant Valley Creek (figure 3) for fish-passage-friendly structures and water temperature reduction. Excavate dirt berms, recontour slopes, remove pipe, and seed with native vegetation on upper and lower ponds.

Use prescribed fire in early spring, late summer, or fall (Howard 1996, Tirmenstein 1988) to promote quaking aspen for rejuvenation of existing stands or increase coverage of aspen.

Review literature for water regimes and soil types required for willow, alder, and birch.

Determine viability of sport fish populations by evaluating species presence, potential for continued reproduction, population size capable of supporting expected fishing pressure, and recovery of absent species.

Remove the drop structure at the old headquarters pond or install a fish ladder.

Remove fish barriers in Pleasant Valley Creek downstream from the refuge, in collaboration with NRCS and private landowners.

Complete riparian habitat enhancement and restoration of native fish, in collaboration with NRCS, MFWP, Partners for Wildlife, Trout Unlimited, and USGS.

Monitor stream temperature and siltation in Pleasant Valley Creek each summer after revegetation has occurred, in collaboration with MFWP.

Monitor revegetation along Pleasant Valley Creek through vegetation classification every third year.

Establish point counts in stream habitat to determine if revegetation along Pleasant Valley Creek enhances use by birds.

Conduct surveys for migratory birds, songbirds, amphibians, and vegetation before and after restoration efforts in refuge ponds and Pleasant Valley Creek, in collaboration with NRCS and volunteers.

Monitor vegetation coverage of willow, alder, and birch.

WETLAND HABITAT

Lakes, bogs, and other saturated wetland areas are addressed in the management direction for wetland habitat.

GOAL

Provide breeding, resting, and feeding habitat for wetland-dependent species of northwestern Montana by restoring, maintaining, and enhancing a mosaic of lake, semipermanent, seasonal, temporary, and saturated wetlands.

Wetland Habitat Objectives

The basis for the following objectives and strategies is described in rationales 8–12 and 14–15, found in appendix H.

- Recharge 100 percent of drained wetlands...*as in alternative A*
- Restore Dahl Lake complex water levels...*as in alternative A*
- Increase ground-nesting habitat...*as in alternative A*
- Conduct a wetland study in the Dahl Lake complex...*as in alternative A*
- Inventory for fens (alkaline bogs) ...*as in alternative A*
- Convert reed canarygrass by 40–80 percent in the Dahl Lake wetland complex by planting wild rice within 10 years of CCP approval, to increase forage for migratory waterfowl.
- Maximize water manipulation capabilities in wetland basins by installing two or three water control structures within 7 years of CCP approval, to increase diverse emergent vegetation and seed-producing annuals interspersed with open water for increased foraging habitat and brood cover for migratory waterfowl.
- Evaluate the feasibility of restoring Lower Moose pond's breached dam on Pleasant Valley Creek within 6 years of CCP approval, to determine potential for maintaining a permanent wetland for nesting waterfowl, wildlife observation, and photography.

Strategies

Restore or increase water-holding capabilities in wetlands on the WRP easement, e.g., plug ditches, in coordination with the NRCS.

Install a water control structure in the culvert near headquarters to allow water to fill the wetland to road height without washing out the road.

If runoff should not be adequate the first year for wetland refill of each restored basin, divert water for 5 years to initiate recharge of the basin.

Plug wetland drain ditches in the wetlands west of Dahl Lake within the west mitigative parcel.

Fill the drain ditch (Meadow Creek) coming out of the west end of Dahl Lake with off-site spoils that remain on-site, and by trucking in spoils to fill the ditch back west to the location of the old water control structure (figure 3).

Evaluate soils and water regime for optimal sites in the Dahl Lake wetland complex to plant wild rice.

Determine the best method to convert reed canarygrass to wild rice; consult with experts and review literature.

Use grazing, haying, and prescribed fire to maintain open water and remove decadent, residual, emergent vegetation with adaptive management.

Use spring flooding to increase colonization of macroinvertebrates (Nelson and Kadlec 1984), and fall flooding to stimulate growth and productivity of invertebrates (Reid 1985); monitor for adaptive management.

During migration, use shallow flooding or partial drawdowns to concentrate invertebrates (Fredrickson and Reid 1986); monitor for adaptive management.

Construct 0.5-acre nesting islands to be irregular in shape with 5:1 slopes, top-dressed with soil, and seeded with native grasses and legumes for ground-nesting habitat.

Evaluate and determine a fish-friendly passage that allows Lower Moose Pond to remain, working with NRCS during the Pleasant Valley Creek restoration.

Monitor wetland vegetation coverage response to recharge every third year; map in the GIS.

Annually monitor vegetative response by measuring habitat coverage; map in GIS.

Survey wet meadows for dominant plant species and presence of peat; measure pH of soil in suspect areas.

Monitor wild rice plantings for success of germination and survival; apply adaptive management.

Monitor invertebrate diversity and abundance.

Conduct migratory waterfowl surveys for spring and fall migration use of the refuge.

Annually conduct pair-count surveys for water birds to monitor use of wetlands pre- and post-refill.

GRASSLAND HABITAT

This management direction is for the diverse grasslands covering the majority of the refuge.

GOAL

Restore, enhance, and maintain Intermountain grasslands, with an emphasis on native bunchgrass prairie to provide habitat for migratory birds, species of concern, and associated wildlife species.

Grassland Habitat Objectives

The basis for the following objectives and strategies is described in rationales 18–22 and 25–26, found in appendix H.

- Fence and post the entire refuge boundary...*as in alternative A*
- Develop soil descriptions...*as in alternative A*
- Monitor, every 2 years, 336 acres of western wheatgrass...*as in alternative A*
- Map and use adaptive management to maintain native bunchgrass prairie (dominated by 50–80 percent Idaho or rough fescue and western wheatgrass, with 5–10 percent forbs, and 0–5 percent shrubs) on 1,200 acres of uplands in management units 6 and 22 (figures 2 and 4), within 10 years of CCP approval, to provide habitat for migratory birds and winter range for elk and deer.
- Inventory and use adaptive management to maintain 330 acres of Idaho fescue and western wheatgrass in upland grasslands around the Dahl Lake wetland complex (management units 11 and 12, figures 2 and 4) as tall, dense grasslands with litter depth 0.6–1.2 inches and 11.8 inches VOR (Kirsch et al. 1978, Duebbert and Lokemoen 1976, Kruse and Bowen 1996), starting within 5 years of CCP approval, to provide nesting habitat for mallard, gadwall, and lesser scaup.
- Monitor 770 acres dominated by Idaho fescue in management units 8–10, 15, and 20 (figure 2), starting within 5 years of CCP approval; for Idaho fescue, average 8–12 flower stalks/plant, 7.9–8.7 inches maximum leaf length/plant, 2.2–2.7 inches square live basal area (Mueggler 1970, 1975), and 5–9 inches leaf height (Pond 1960), to determine when management action is needed to maintain

vigorous plant communities for ground-nesting migratory birds and forage for other wildlife.

Strategies

Fence and post the refuge boundary; use staff from the National Bison Range complex or contracted personnel.

Use wildlife-friendly fencing in areas of high wildlife use, where feasible.

Survey or find markers in areas of uncertainty for the refuge boundary.

Use existing soils layers to determine which soils have not been classified.

Sample soils and describe associated climax vegetation for each unclassified type; perform through a request to the NRCS.

Set priorities for restoration within the WRP easement (345 acres) in the bottomlands (see south of the county road, figure 4), in collaboration with NRCS restoration efforts.

Determine the best restoration method and plant species of replacement; consult with experts and review literature.

Develop a habitat management plan describing how rest, prescribed fire, grazing, or haying will be used to maintain migratory bird nesting habitat in areas of: (1) western wheatgrass and Kentucky bluegrass; and (2) Idaho fescue and western wheatgrass on upland grasslands.

Use grazing and prescribed fire as habitat management tools for Idaho fescue once monitoring results demonstrate management targets have been achieved and compatibility agreements have been developed with the NRCS.

Conduct grazing and burning every 7–10 years to remove residual vegetation and restore vigor (Mueggler 1975).

Monitor areas dominated by Idaho fescue (live basal area, leaf height, leaf length, and flower stalks/plant) to determine current habitat condition and monitor for management thresholds every 2 years.

Monitor vegetation every third year to determine percent composition, amount of residual, litter, and condition of plants (vigor) prior to any type of management treatment.

FOREST HABITAT

Coniferous and deciduous forests are addressed in the management direction for forest habitat.

GOAL

Enhance and maintain Douglas-fir, ponderosa pine, aspen, and cottonwood forested habitats within the context of the Fisher River watershed for migratory birds, species of concern, and other associated wildlife species.

Forest Habitat Objectives

The basis for the following objectives and strategies is described in rationales 29–30 and 33–34, found in appendix H.

- Identify forest coverage types...*as in alternative A*
- Inventory and maintain a ponderosa pine, mixed-conifer forest with: (1) widely spaced trees (20-foot spacing between pines); (2) open grassy areas; (3) an understory of fescue or junegrass and snowberry or kinnikinnick; and (4) 20–30 percent of pole-sized stands to remain as cover; within 10 years of CCP approval, to provide foraging habitat and thermal cover for elk and deer.
- Create nesting habitat for Merriam's turkey (Lutz and Crawford 1987) by thinning 10 percent of pole-sized conifer stands and leaving the remaining tree slash on the ground (in forest on the west end of the refuge, remove Douglas-fir > 2 feet tall and up to 6 inches dbh, and ponderosa and lodgepole pine > 2 feet tall and up to 4 inches dbh), within 10 years of CCP approval, to maintain or increase the nonnative turkey population for hunting opportunities.

Strategies

Survey for deteriorating aspen stands—as defined by a low density of stems that are young and small, and with poorer form and higher crown/stem ratios than healthy stands (Schier and Campbell 1978).

Halt Douglas-fir encroachment of young even-aged stands of ponderosa pine; remove Douglas-fir > 2 feet tall and up to 6 inches dbh, and ponderosa pine > 2 feet tall and up to 4 inches dbh.

Chainsaw Douglas-fir poles and let lie.

Suppress understory fires except in areas where age-class structure is being altered to abnormally dense stands dominated by younger trees.

Provide bald eagle habitat by maintaining a mature forest stand comprised of aspen, Douglas-fir, ponderosa pine, or mixed conifers with low to moderate canopy cover of at least 20 acres within 1 mile of Dahl Lake; stand would contain at least two suitable nest trees and at least three perch trees.

Manage bald eagle habitat in the secondary nesting zone if suitable habitat does not exist in the primary nesting area; maintain mature forest comprised of aspen, Douglas-fir, ponderosa pine, or mixed conifers with low to moderate canopy cover of at

least 20 acres within 1 mile of Dahl Lake; stand would contain at least two suitable nest trees and at least three perch trees.

Develop a fire management plan for forests above 3,300 feet in elevation that mimics natural fire regimes for Canada lynx habitat.

Prohibit precommercial thinning or clear cutting of woodland Canada lynx habitat.

Restrict livestock use in openings created by fire or timber harvest that would delay successful regeneration of the shrub and tree components in forests above 3,300 feet in elevation, for Canada lynx habitat.

Manage grazing in aspen stands to ensure sprouting and sprout survival in aspen stands above 3,300 feet elevation for Canada lynx habitat.

Classify forest vegetation into National Vegetation Classification Standards; map in geographic information system database.

Annually monitor for negative effects of water level changes on aspen groves in management units 12 (3 acres), 14 (23 acres) and 19 (24 acres) to determine if there is a loss in acreage.

Monitor effects of prescribed fire in aspen and apply adaptive management.

INVASIVE PLANTS

Prevention and control of nonnative, invasive plants are addressed in the management direction for invasive plants.

GOAL

Native plant communities, composition, occurrence, and density exist without degradation by invasive plants.

Invasive Plant Objectives

The basis for the following objectives and strategies is described in rationales 36–39 and 41, found in appendix H.

- Develop and implement an invasive plant management plan...*as in alternative A*
- Reduce spotted knapweed...*as in alternative A*
- Annually eradicate and maintain 75–90 percent control of tansy ragwort...*as in alternative A*
- Conduct a surveillance program for new infestations of invasive plants...*as in alternative A*
- Conduct invasive plant control on 300–400 acres of upland grasslands each year for the next 15 years, to maintain native prairie composed of 90 percent native vegetation composition.

- Determine the best method possible and begin restoration of 35 percent of the introduced creeping meadow foxtail in the bottomlands to native grass and sedges (figure 4), within 1 year of CCP approval, while maintaining 25–40 percent of the foxtail tracts with a minimum of 0.6 inch litter depth and 3.9–7.9 inches VOR, to provide nesting habitat for blue-winged teal and mallard during the restoration process.

Strategies

Evaluate invasive plant infestations and control efforts since refuge establishment.

Evaluate invasive plant infestations within Pleasant Valley for priority areas of control by each partner.

Determine appropriate, effective control methods, e.g., mowing, chemical, biocontrol, and prescribed fire; consult with experts.

Determine the best restoration method and plant species of replacement in invasive plant infestations; consult with experts and review literature.

Gather information about cumulative impacts of chemical, biocontrol, and prescribed fire effects on invasive plants and on native vegetation response; review literature.

Use the GIS to predict areas at greatest risk of new invasions and develop early detection and prevention measures.

Continue to discuss, with partners, alternatives for invasive plant control within the Pleasant Valley.

Share GIS layers of invasive plant infestations with PCTC and the USDA Forest Service.

Apply integrated pest management for spotted knapweed, consisting of: (1) proper spring and fall chemical applications; (2) mechanical mowing where practical, prior to seed head production; and (3) release of appropriate biocontrol agents, including seed head gall flies and other proven biocontrol agents.

Use hand pulling, hand spraying, and ATVs for herbicide application in areas within 330 feet of Spalding's catchfly populations.

Evaluate the target species selectiveness of any biocontrol species prior to release.

Treat new invasions of tansy ragwort in late July and early August by bagging flower heads and burning them, and spraying rosettes with chemicals such as Transline or Tordon.

Control invasive plants with cutting and herbicide in forest.

Survey proposed spray areas for Spalding's catchfly prior to herbicide application.

Use ground and aerial herbicides to inhibit and eradicate encroachment by invasive plants.

Coordinate invasive plant control in Pleasant Valley by meeting at least once per year to share information and discuss control strategies: (1) with PCTC for spotted knapweed; and (2) with PCTC and the USDA Forest Service for tansy ragwort.

Map sites of invasive plant treatment each year in GIS.

Develop a strategy with partners for coordinated control of tansy ragwort and how to prevent it from becoming a dominant plant species within the Pleasant Valley.

Attain assistance with tansy ragwort control from the Tansy Trust Fund Grant program, as well as from the Service's challenge cost-share grants.

Attain herbicide and/or a technician to apply herbicide and assist with mapping by pursuing grant funding.

Attain assistance with invasive plants (applications and monitoring) by pursuing grant funding through the project advisory committee, e.g., RMEF grants, until the refuge can support its own needs for control.

Mitigate disturbance on refuge roads with invasive plant control and reseeding of native species through the ongoing memorandum of understanding with PCTC.

Limit off-road vehicle travel and wash the undercarriages of vehicles that access off-road areas.

Determine the extent of infestation of sulfur cinquefoil; create a baseline map.

Monitor infestation rates and effectiveness of control efforts; annually map the extent of infestation of spotted knapweed and tansy ragwort in GIS.

Identify locations of new infestations of tansy ragwort; map locations and collaborate with the state coordinator for mapping records for neighboring PCTC land.

Monitor vegetation of upland grasslands for vigor and plant species composition every 2 years.

Monitor plant species occurrence and percent cover, along with wildlife use, pre- and postrestoration.

Gather information about invasive plant occurrence; inform all Service employees that may work on the refuge about plant and habitat characteristics of invasive plants to get help finding invasive plants during normal field duties.

Conduct walk-through surveys for invasive plants with volunteers to look for new infestations.

MIGRATORY BIRDS

Management direction for migratory birds addresses waterfowl, other water birds, shorebirds, and Neotropical migratory birds.

GOAL

Preserve, restore, and enhance the ecological diversity and abundance of migratory birds of the Intermountain West forest, wetland complexes, riparian habitat, and bunchgrass prairie.

Migratory Bird Objectives

The basis for the following objectives and strategies is described in rationales in appendix H.

Water Bird Objectives

Rationales 42–45 and 48 are found in appendix H.

- Annually monitor goose populations...*as in alternative A*
- Evaluate biological potential for shorebirds and marsh birds...*as in alternative A*
- Determine current levels of nesting and production of waterfowl, and develop a waterfowl management plan within 5 years of CCP approval that uses adaptive management until a 5-year average of 500 young fledged per year is obtained, to maximize duck production, and improve public use opportunities.
- Determine limiting factors to fall waterfowl populations, and use adaptive management to increase fall waterfowl numbers by at least 20 percent over the next 10 years, to provide habitat for migratory waterfowl, and improve public use opportunities.

Strategies

Determine limiting factors and conduct research; consult with the Montana Cooperative Wildlife Research Unit and other experts.

Evaluate development of food plots to support migrating waterfowl.

Use habitat manipulation and predator control as adaptive management tools to increase production when necessary to achieve objectives.

Construct goose and duck nesting structures on Dahl Lake, Upper and Lower Moose ponds and SE Pond.

Evaluate creation of a nesting island out of the peninsula on the east end of Dahl Lake.

Determine nesting requirements of shorebirds and marsh birds and best management practices; review literature.

Continue to prohibit waterfowl hunting until a minimum average of 1,000 ducks from opening day of waterfowl season until the start of freeze-up are present.

Prohibit haying, mowing, and grazing immediately proceeding and during the nesting season of shorebirds and marsh birds.

Evaluate sandhill crane nesting; develop a plan to improve nesting if cranes are nesting or attempting to nest on the refuge.

Conduct weekly waterfowl surveys from mid-August until freeze up.

Continue duck pair counts and implement duck brood index survey.

Survey for availability of dense, tall (>60 centimeters) emergent vegetation for nesting cover for bitterns, terns, and redheads.

Continue established point counts; conduct additional surveys (point counts, nest dragging, nest searching, and playback surveys) in the upland grasses, forest, and NRCS restoration areas.

Initiate nest dragging to determine hen success and rates of nest predation.

Conduct invertebrate and vegetation surveys to determine available forage from mid-August until freeze-up.

Monitor invertebrate levels in Dahl Lake and wetland complex to determine if this is a limiting factor.

Inventory and monitor emergent and submergent vegetation availability as forage or forage substrate in late summer and fall.

Monitor for shorebirds and marsh birds during duck pair and brood counts, Neotropical migratory bird surveys, and with playbacks.

Other Migratory Birds Objectives

Rationales 54–57 are found in appendix H.

- Obtain baseline data on relative abundance and production of indicator species of Neotropical migratory birds...*as in alternative A*
- Protect nesting habitats including 80 percent of natural snags...*as in alternative A*

Strategies

Construct and place new nest boxes for Neotropical migratory birds in unoccupied, suitable habitat using volunteers.

Set priorities for species by habitat and sensitivity rating and manage for key indicator species in each habitat; use the MPIF guidance.

Analyze survey data for the most common priority species and their habitat requirements; apply adaptive management to foster their populations.

Maintain diverse healthy habitat and an abundant prey base for raptors.

Protect snags in forest habitat.

Conduct owl surveys in suitable habitat following the protocol set out in Guidelines for Nocturnal Owl Monitoring in North America (March 2001) as a silent listening technique, adding playback surveys that are recorded separately.

Conduct surveys that detect woodpeckers.

Monitor nesting and maintain structures and boxes using volunteers and refuge staff.

OTHER WILDLIFE

Resident wildlife including large and small mammals, resident birds, amphibians, and reptiles are addressed in the management direction for other wildlife.

GOAL

Restore and maintain resident and endemic wildlife populations of northwestern Montana to maintain and enhance species diversity of Lost Trail National Wildlife Refuge and Pleasant Valley.

Other Wildlife Objectives

The basis for the following objectives and strategies is described in rationales in appendix H.

Large Mammal Objectives

Rationales 61–66 and 68 are found in appendix H.

- Maintain elk, deer, and moose populations...*as in alternative A*
- Modify or remove all nonessential fences...*as in alternative A*
- Develop a plan for chronic-wasting disease...*as in alternative A*
- Monitor large mammal population sizes and areas of use for 5 years after CCP approval, to establish baseline data for development of objectives that enhance viewing, hunting, environmental education, and photography.

Strategies

Improve habitat quality through invasive plant control, native plant restoration, prescribed fire, and grazing.

Hire a biologist to monitor and evaluate wildlife population dynamics, and to conduct necessary control.

Hire biological staff or use the biologist from the National Bison Range complex, along with volunteers, to conduct monitoring.

Construct temporary fences (electric or barbless wire) if needed.

Identify fence locations and determine their importance for refuge management; map using a global positioning system.

Remove all fences (interior only) or modify fences for wildlife-friendly movement. Remove either the top and bottom wire or two bottom wires so the bottom wire is at least 18 inches off the ground; remove stays to enhance movement or use lay-down wires.

Incorporate additional gates into fences where it is not feasible to modify them; keep gates open when livestock are not present in grazing units.

Develop a system to estimate deer and elk populations on the refuge; review literature for current, valid methods.

Determine best management practices to use in response to monitoring data on deer and elk populations and how they are being affected by refuge management or how they are affecting the refuge; coordinate with MFWP. Apply adaptive management, e.g., modify hunting seasons, or use fire, invasive plant control, or grazing to improve forage.

Determine if large mammal resource damage is a result of local factors or reflects an ecosystem phenomenon, through comparison of deer and elk population trends on the refuge with MFWP trend data for the ecosystem.

Coordinate proposed prevention, surveillance, research, and control actions for chronic-wasting disease in cooperation with state wildlife and agriculture agencies.

Conduct outreach to surrounding communities and communication to refuge visitors regarding chronic-wasting disease and disease management.

Remain alert to potential threats from chronic-wasting disease or other diseases.

Determine baseline populations of large mammals; monitor for 3 years and consult MFWP.

Annually inventory deer and elk population sizes and areas of use.

Monitor abundance and presence of elk (in the winter), deer (in the summer), and moose (in the spring or summer).

Determine the cause of any decrease below 75 percent of current herd sizes for deer, elk, and moose; determine if modifications in management

are warranted. Monitor deer and elk to determine high-use areas and design public use activities around these areas.

Categorize the vegetation in areas of high use by deer, elk, and moose; map locations and categories.

Ensure deer and elk are staying within the carrying capacity; evaluate areas of high use for browse-line impacts.

Evaluate the effects of public use in areas of habitat damage to determine if overuse of specific habitats by deer and elk is a result of wildlife response to disturbance.

Conduct a passive surveillance program for clinical signs of chronic-wasting disease or other health problems (may lead to a targeted surveillance based on results); conduct monthly, opportunistic observations of deer and elk.

Monitor deer, elk, and moose use of refuge habitats to determine high-use areas and design public use activities around these areas.

Evaluate all public uses for their effects on herd numbers and distribution of wildlife on the refuge.

Small Mammal Objectives

Rationale 70 is found in appendix H.

- Monitor Columbian ground squirrel habitat acreage...*as in alternative A*

Strategies

Determine ground squirrel activity centers; map by size of population and damage to vegetation in the geographical information system (GIS).

Determine an acceptable baseline level for habitat affected by ground squirrels and their population numbers, using initial data.

Maintain ground squirrel numbers within 20 percent of a baseline determined after initial monitoring and literature research.

Determine changes in acres affected by ground squirrels; monitor ground squirrel activity on a 3- to 5-year basis.

Resident Bird Objectives

Rationales 72–73 and 76 are found in appendix H.

- Annually inventory and monitor resident (nonmigratory) birds...*as in alternative A*
- Biannually monitor upland game bird populations, and apply adaptive management to foster upland game bird populations, to provide public use opportunities and maintain a healthy ecosystem.

Strategies

Maintain aspen stands at current acreage for upland game birds with prescribed fire and by limiting grazing.

Determine potential effects of management activities to species listed as priority for conservation by MPIF Plan (Casey 2000) or the Service's office of migratory bird management (1995).

Determine whether management practices should be implemented to foster upland game birds; review refuge data with data gathered by MFWP.

Continue annual Neotropical migratory bird surveys and detect all resident and migratory birds through addition of one survey route in the uplands.

Inventory for Montana Bird Conservation Plan priority 1 species such as flammulated owls and black-backed woodpeckers.

Conduct surveys for upland grouse species.

Implement an owl survey once a year for the next 3 years, using volunteers.

Survey turkeys only if it is perceived that their population has increased to the point of resulting detrimental effects on habitat or other priority species.

Record any incidental sightings of bird species on the refuge.

Amphibian and Reptile Objectives

Rationales 78–80 are found in appendix H.

- Gather amphibian and reptilian population data...*as in alternative A*

Strategies

Develop habitat guidelines for amphibians and reptiles; consult experts.

Learn survey techniques and design surveys; coordinate with the “Amphibian Research and Monitoring Initiative” team.

Gather amphibian population data on the refuge as part of the “Amphibian Research and Monitoring Initiative,” in partnership with USGS researchers.

Include the use of equipment, housing, or vehicles for refuge in-kind support to the USGS for the “Amphibian Research and Monitoring Initiative.”

Report amphibian data to the regional level, i.e., “Amphibian Research and Monitoring Initiative” team, to support ecosystem-level monitoring.

SPECIES OF CONCERN

This management direction addresses wildlife listed by state or federal agencies as threatened and endangered (or proposed or candidate for listing), sensitive, rare, or species of concern.

GOAL

Contribute to the conservation, enhancement, and recovery of endangered, threatened, and species of concern populations in Lost Trail National Wildlife Refuge and Fisher River watershed.

Special of Concern Objectives

The basis for the following objectives and strategies is described in rationale 83, found in appendix H.

General Objectives

- Develop a conservation easement program (preliminary project proposal), for large carnivores...*as in alternative A*
- Develop, within 10 years of CCP approval, a list of birds known to inhabit the refuge including species of concern, their conservation needs, and suggested viewing areas, to raise awareness of species of concern and foster support for their conservation.
- Monitor for occurrences of species of concern and, for those species that exist on the refuge, develop management objectives that have minimum impact on public use, within 10 years of CCP approval, to protect species of concern while maintaining quality public use.

Strategies

Develop a conservation strategy with PCTC to protect their lands from future development.

Develop a preliminary project proposal for the conservation easement program, delineating a focus zone and priority areas.

Hire a biologist to be stationed at the refuge to coordinate management for the grizzly bear and monitor Canada lynx activities.

Seek funding from the Land and Water Conservation Fund for a conservation easement program.

Survey for owls, rails, and rare species; and monitor bald eagle nests and black tern nesting colonies; request assistance from Audubon volunteers.

Use data about species of concern collected in Neotropical migratory bird surveys, historic records, and observations recorded during routine staff duties to develop a bird list.

Grizzly Bear Objectives

Rationales 87–89 and 92 are found in appendix H.

- Prohibit livestock grazing if a grizzly bear is within 1 mile...*as in alternative A*
- To ensure compliance with the ESA and to support the mission of the Service, minimize conflicts with and disturbance to grizzly bears...*as in alternative A*
- To improve support for and understanding of grizzly bears, the refuge's public use staff (or partners) will conduct or coordinate one workshop or field trip per year and will develop at least one interpretive display and one information sheet...*as in alternative A*
- Improve habitat for grizzly bear within 15 years of CCP approval, to increase the chance of grizzly bear occurrence on the refuge, and improve the potential for public viewing opportunities.

Strategies

Evaluate current grizzly habitat components of Pleasant Valley; use the GIS and consultation with neighbors.

Determine the effects that proposed management actions would have on grizzly bears; consult with biologists.

Close areas for grizzly bears through the use of signs and other informational material; enforce closures through law enforcement patrols.

Limit administrative activity in areas of grizzly bear activity.

Prevent livestock–bear competition for spring forage by restricting livestock grazing if a grizzly bear is within 1 mile of the refuge.

Close designated areas to all public access (based on each particular situation) when one or more grizzly bears are within 1 mile of the refuge.

Work with the interpretation and education subcommittee of the Interagency Grizzly Bear Committee.

Monitor the occurrence and location of grizzly bears in Pleasant Valley, in collaboration with private landowners, MFWP, Interagency Grizzly Bear Coordination team, USDA Forest Service, and PCTC.

Follow guidelines of the Grizzly Bear Compendium (LeFranc et al. 1987) to evaluate habitat and security within Pleasant Valley.

Supply those components of grizzly bear habitat that are limiting in Pleasant Valley.

Prohibit hunting of ground squirrels unless it becomes biologically necessary to protect resources.

Prohibit black bear hunting.

Gray Wolf Objectives

Rationales 93–96 and 99–100 are found in appendix H.

- Evaluate the effects of management decisions on gray wolves...*as in alternative A*
- Monitor and maintain habitat and sufficient native prey to support one pack of gray wolves...*as in alternative A*
- Prohibit livestock grazing when a wolf pack is present in Pleasant Valley...*as in alternative A*
- To educate the public and foster support for wolf recovery, the refuge's public use staff in collaboration with the wolf recovery team will have one interpretive field trip or workshop a year, and develop one interpretive display and one information sheet...*as in alternative A*

Strategies

Determine the effects that proposed management actions would have on gray wolves; consult with biologists.

Maintain sufficient natural prey to support one pack of wolves in Pleasant Valley; use adaptive management.

Foster prey for the gray wolf (deer and elk) by improving winter range: apply integrated pest management, plant desirable forage species, and limit disturbance from public use.

When wolves are residing in Pleasant Valley, communicate with the wolf recovery team, MFWP, PCTC, and surrounding landowners.

Prohibit livestock grazing when a wolf pack, as defined by the wolf recovery team, is present in Pleasant Valley.

Close the refuge to public access within 1 mile of any active wolf den or rendezvous site from May 1 to July 1.

Close designated areas of the refuge to all public access from December 1 to April 15 if wolves are in the Pleasant Valley watershed.

Prohibit sport trapping.

Use MFWP data and refuge monitoring of deer, elk, and moose populations to determine changes in the natural prey available to wolves on an annual basis.

Evaluate hunting for its effects on prey populations; however, hunting will remain an authorized public use unless determined to be in direct conflict with wolf survival.

Collaborate with the wolf recovery team and MFWP.

Canada Lynx Objectives

Rationale 103 is found in appendix H.

- Evaluate proposed management actions in Canada lynx habitats...*as in alternative A*

Strategies

Evaluate the effects that Canada lynx management would have on other priority species against the probability that lynx would benefit from the management activity or prohibition of such activity.

Prohibit sport trapping for the life of this CCP to prevent accidental death of lynx.

Bald Eagle Objectives

Rationales 107–109 and 112–113 are found in appendix H.

- Annually monitor bald eagle nesting and protect habitat...*as in alternative A*
- To maximize the potential for nesting of bald eagles, maintain a mature forest stand...*as in alternative A*
- Remove carrion from roadsides...*as in alternative A*
- To enhance recovery of the bald eagle in Montana, eliminate disturbance and protect or enhance breeding habitat within 0.25 mile of any occupied bald eagle nest, until the bald eagle is delisted and for 5 years thereafter.
- To enhance recovery of the bald eagle in Montana, minimize disturbance and maintain the integrity of the breeding area between 0.25 and 1.0 mile of any occupied bald eagle nest, until the bald eagle is delisted and for 5 years thereafter.
- Maximize opportunities for education, viewing, and photographing of bald eagles by developing one viewing and photography blind, one interpretive display, and one information sheet within 10 years of CCP approval.

Strategies

Maintain bald eagle habitat by designing habitat alterations that meet preferred nesting and feeding habitat characteristics.

Protect bald eagles by evaluating proposed pesticide use before application.

Hire a biologist to evaluate or facilitate the evaluation of the effects of existing power lines on bald eagles.

Annually compile sightings and habitat use data for trumpeter swans in Pleasant Valley area; coordinate through neighboring landowners, MFWP, PCTC, and USDA Forest Service.

Prohibit sport trapping.

Follow the hunt plan (2002) that limits hunting to deer, elk, moose, turkey, and grouse and designates a closed area in which the existing bald eagle nest is located.

Allow low-intensity activities such as dispersed recreation if the bald eagle breeding area has had at least 65 percent nest success and has fledged at least five young during the preceding 5 years.

Evaluate the effects of the viewing display and blind to ensure that productivity objectives for the bald eagle are being met.

Monitor bald eagle nest success to ensure that breeding areas have at least 65 percent nest success, and at least five young fledged during the preceding 5 years.

Monitor occupied bald eagle nest sites to determine fledgling success, using staff or volunteers.

Conduct surveys in a noninvasive manner after the hatching of bald eagle young.

Evaluate all management activities proposed in the primary nesting zone; monitor the effects on bald eagles of any approved activity.

Trumpeter Swan Objectives

Rationales 116–117 and 119 are found in appendix H.

- Annually monitor trumpeter swan migration and nesting...*as in alternative A*
- Annually monitor trumpeter swan migration and nesting in the Pleasant Valley ecosystem, to assist in trumpeter swan conservation, and to alert the public of potential viewing and photographic opportunities.
- Within 5 years of CCP approval, evaluate the impact that reintroduction of trumpeter swans to Dahl Lake would have on other lake-dependent species and associated public uses to determine the feasibility of introducing trumpeter swans.

Strategies

Limit public access in the trumpeter swan-nesting area, depending on nest site location.

Use signs to post trumpeter swan-nesting areas closed to public use; develop interpretive material to explain closures.

Monitor for trumpeter swans during routine duties including duck pair and brood counts.

Survey the public to assess public opinion on the reintroduction of trumpeter swans.

Provide lookouts during the swan migration and nesting season; seek assistance from Flathead Audubon volunteers.

Black Tern Objectives

Rationales 121–123 are found in appendix H.

Annually monitor the number of nesting black terns, and monitor nesting and foraging habitat...*as in alternative A*

Strategies

Survey for presence, abundance, and nesting activity of black terns on Dahl Lake to determine the nesting population associated with current levels of emergent vegetation.

Determine the effects of wetland development on black tern habitat by doing pre- and postactivity measurements of vegetation response and water depth in emergent vegetation areas adjacent to open water; map acreages of emergent vegetation and open water in GIS.

Monitor black tern nesting response to changes in water levels of Dahl Lake during implementation of the habitat development plan and other management activities.

Boreal Toad Objectives

Rationale 124 is found in appendix H.

Determine, during amphibian surveys, the extent of use of refuge habitats by the boreal toad.

Strategies

Document the response of boreal toads to revegetation and restoration of Pleasant Valley Creek; continue collaborative project with USGS's Amphibian and Reptile Monitoring Initiative.

Spalding's Catchfly Objectives

Rationale 125 is found in appendix H.

- Maintain Spalding's catchfly populations...*as in alternative A*
- Inventory for Spalding's catchfly prior to any management actions...*as in alternative A*
- Annually control invasive plants around any Spalding's catchfly population that has a minimum of 20 plants...*as in alternative A*

Strategies

Inventory all suitable habitat within the legislative boundary of the refuge for the presence of Spalding's catchfly.

Locate and map sites of Spalding's catchfly using GPS technology.

Search suitable habitat for Spalding's catchfly plants using volunteers from local schools and the Montana Native Plant Society, and Landmark Volunteers.

Establish a list of volunteers that are willing to help inventory for Spalding's catchfly or control invasive plants in catchfly habitat.

Report locations of Spalding's catchfly populations to the Montana Natural Heritage Program.

Conduct site evaluations for habitat characteristics of Spalding's catchfly to better manage present and other potential sites of suitable habitat.

Evaluate short-term, long-term, and cumulative effects of management actions (e.g., invasive plant control and prescribed fire) on maintenance and restoration of Spalding's catchfly.

Protect Spalding's catchfly sites from trampling and grazing.

Monitor all Spalding's catchfly populations on the refuge to determine population trend.

Monitor Spalding's catchfly from mid- to late July when flowers are in bloom using walk-through surveys.

Monitor Spalding's catchfly sites for insect damage and apply adaptive management to protect plants.

Map invasive plant populations within and around all Spalding's catchfly populations.

Coordinate and collaborate with Montana DNRC to maintain Spalding's catchfly plants.

Maintain native Palouse prairie habitat in and around the Spalding's catchfly site with sufficient native forb composition to attract, but not compete for, pollinators.

CULTURAL RESOURCES

Archaeological and historical resources, as well as traditional uses, are addressed in the management direction for cultural resources.

GOAL

Protect, manage, and interpret archaeological, cultural, and historical resources present at Lost Trail National Wildlife Refuge for the benefit of present and future generations.

Cultural Resources Objectives

The basis for the following objectives and strategies is described in rationales 126–130, found in appendix H.

- To preserve resources for all Americans and be in compliance with applicable laws and legislation, maintain and protect documented cultural and historical resources...*as in alternative A*

- Survey all refuge lands for cultural resources...*as in alternative A*
- Develop an outreach program...*as in alternative A*
- As a steward of cultural and historical resources to the Nation, research feasibility and restoration of at least one cultural and historical resource, within 10 years of CCP approval.
- To provide a cultural and historical foundation of Lost Trail National Wildlife Refuge and the Pleasant Valley, develop a museum with displays within 10 years of CCP approval.

Strategies

Survey for cultural resources before doing developments and restoration activities.

Identify and nominate eligible properties to the National Register of Historic Places, working with appropriate agencies.

Use the most up-to-date techniques for surveying, documentation, preservation, restoration, and research through coordination with region 6's archaeologists, Montana State Historical Preservation Office, the CSKT THPO, and local scholars and experts.

Provide one full-time public use specialist to be trained to conduct and coordinate formal cultural surveys.

Collaborate in efforts to document an accurate and appropriate history of Pleasant Valley and its settlers by researching current and old literature about the area and its inhabitants.

Accommodate access to and ceremonial use of sacred sites by religious practitioners of recognized Native American tribes in accordance with policy.

Develop a resource library of information about cultural sites on the refuge.

Develop programs for the public to experience cultural resources with access to designated sites that are not culturally sensitive and can naturally, or be hardened to, withstand use.

Create a "friends group" to support and raise funds for museum development.

Retrofit the historical horse barn into a museum, making it accessible to all users, without impairing the integrity of the building.

Make the museum accessible to all users through coordination of facility design with the National Center on Accessibility, the Summit Independent Living Center, and other groups.

Research and develop appropriate themes for the museum, in collaboration with applicable Native American tribal representatives and local historians.

Provide one part-time historian to conduct formal survey and oversee restoration of sites.

Provide one full-time public use specialist to work with the Service's region 6 EVS staff to design interpretive displays for the museum.

Recruit interns to help develop and staff the museum, while providing educational development.

Provide one full-time law enforcement officer to enforce laws and regulations to protect cultural resources.

Provide one full-time and one part-time maintenance staff to prevent damage and deterioration of resources.

Work with region 6's archaeologist to develop and perform a formal review of documented resources every 5 years to ensure protection, evaluation of condition, and preservation.

Dispense outreach materials for cultural resources in partnership with local schools, colleges, and civic groups.

Develop partnerships with the Montana State Historic Preservation Office and CSKT THPO to provide expertise, personnel, and funding.

PUBLIC USE

Priority public uses (wildlife-dependent recreational uses) are addressed in the following management direction for public use.

GOAL

Provide quality wildlife-dependent recreational and educational opportunities for persons of all abilities to learn, understand, and enjoy the Intermountain ecosystem of northwestern Montana; its associated fish, wildlife, and plants of Lost Trail National Wildlife Refuge; and the National Wildlife Refuge System in a safe and compatible manner.

Public Use Objectives

Locations of public use and facilities are displayed in figure 13. The basis for the following objectives and strategies is described in rationales 131–137, found in appendix H.

General Objectives

- Develop a demographic profile of wildlife-dependent recreational users...*as in alternative A*
- Develop and implement a visitor service plan...*as in alternative A*
- Develop one accessible day use area...*as in alternative A*

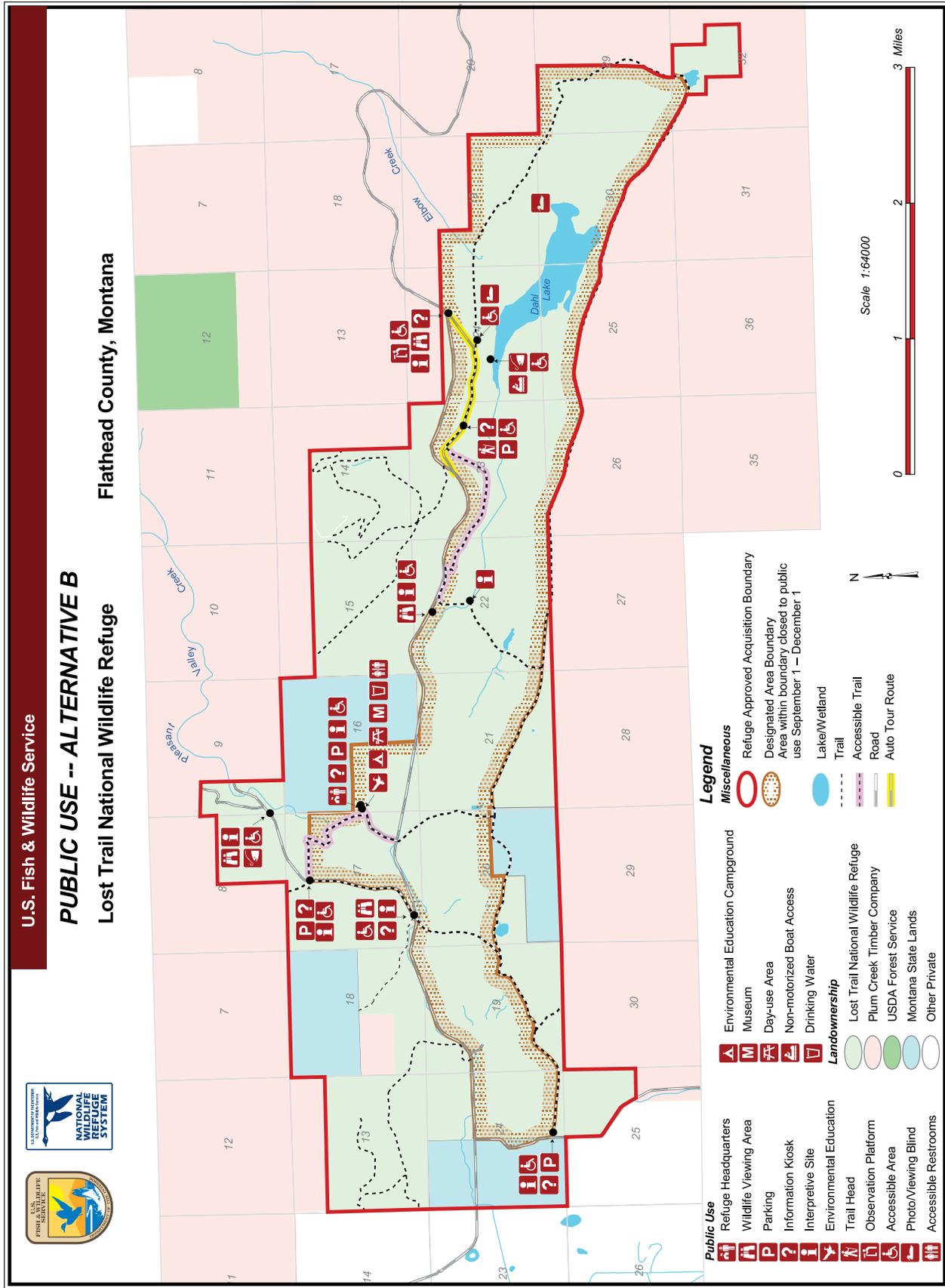


Figure 13. Public use under alternative B of the EA, Lost Trail National Wildlife Refuge, Montana

- To reduce disturbance and increase nest success probability, activities will not be permitted within 0.5-mile of any occupied golden eagle nest...*as in alternative A*
- Allow access for nonmotorized floating devices on Dahl Lake, within 2 years of CCP approval, to support quality wildlife observation, photography, and fishing opportunities.

Strategies

Collaborate with region 6's staff in EVS.

Provide one full-time public use specialist and one career-seasonal park ranger to work with the EVS staff to design, develop, and monitor the public use program.

Provide one full-time public use specialist to work with EVS staff and the Office of Management and Budget to develop a demographic profile of current and future refuge visitors.

Evaluate proposed changes in public access prior to implementation; monitor for effects related to the grizzly bear if access is approved.

Limit public access in trumpeter swan-nesting areas, depending on nest site location.

Incorporate suspension provisions into special-use permits for the presence of grizzly bears.

Incorporate suspension provisions into special-use permits for the presence of wolves.

Allow high-intensity activities outside the nesting season for bald eagles.

Allow existing levels of human activity if the bald eagle breeding area has at least 65 percent nest success, and has fledged at least five young during the preceding 5 years.

Limit disturbance to bald eagles by restricting construction of permanent developments such as kiosks, parking areas, and trails that may increase human activity within 0.25 mile of an occupied bald eagle nest.

Limit high-intensity activities near occupied bald eagle nests during nesting; evaluate and monitor effects of activities on nesting.

Provide one full-time law enforcement officer to contact the public, educate about and enforce ethical standards, and enforce rules and regulations.

Provide one career-seasonal volunteer coordinator to work with EVS staff to establish a volunteer program.

Provide for sales of educational and interpretive publications by developing a formal agreement with a cooperating natural history association.

Promote wildlife-dependent recreation at the refuge, in collaboration with Flathead County Travel Board, Kalispell and Libby Chambers of Commerce, and Travel Montana.

Erect standard refuge entrance signs at entries along main roads.

Design and develop facilities to meet accessibility standards in coordination with region 6's EVS staff.

Ensure that sites are accessible for all users; request design assistance from the National Center on Accessibility, the Summit Independent Living Center, and other groups.

Develop one either-sex accessible restroom facility to be available during daylight hours.

Provide a source of drinkable water available during daylight hours.

Develop and maintain at least three parking areas, three wildlife-viewing areas, one viewing platform, two trails, and two observation blinds (figure 13).

Develop and provide a parking area along East Cattle Station Road.

Develop an accessible day use area with 10 tables and fire pits.

Provide one full-time and one half-time maintenance staff to construct and maintain public use facilities and areas.

Research the potential of a fee program to support facilities.

Open the headquarters/contact station to the public 7 days a week, including weekends during peak use (e.g., hunting season).

Provide one full-time public use specialist to recruit volunteers to staff the contact station to allow for minimum and increased operation.

Provide one career-seasonal clerk and volunteers to daily staff the contact station daily during peak use seasons.

Provide one half-time clerk to staff the contact station and dispense information.

Coordinate with local groups such as Boy Scouts, Girl Scouts, Trout Unlimited, and Flathead Chapter of the Audubon Society to dispense information about low-impact wildlife-dependent recreational opportunities to their members.

Provide one full-time public use specialist to develop and present outreach materials and programs promoting wildlife-dependent recreation. Develop and hold special events and write press releases and news articles.

Determine what effect the presence of trumpeter swans would have on public use around Dahl Lake.

Conduct a formal visitor services requirement evaluation with region 6's EVS staff to determine if the visitor service plan has been met and to determine future needs.

Obtain information on wildlife-dependent recreational users visiting the area, in coordination with MFWP, Flathead County Travel Board, Kalispell and Libby Chambers of Commerce, and the Institute for Tourism and Recreation Research (University of Montana).

Request design assistance from the national Center on Accessibility, the Summit Independent Living Center, and other groups to ensure that sites are accessible for all users.

Develop partnerships with local angler and hunting groups such as Trout Unlimited, Ducks Unlimited, and RMEF to learn of fishing and hunting use in the area, access needs, and sport fishery and hunting goals.

Hunting Objectives

Rationales 141–144 are found in appendix H.

- Allow elk, deer, mountain grouse, and turkey hunting...*as in alternative A*
- Provide special youth-only hunts for deer and elk...*as in alternative A*
- Provide easily accessible information to, and personal contact with, hunters...*as in alternative A*

Strategies

Allow hunters access to portions of the refuge that would provide reasonable challenges and opportunities for taking targeted species under the described harvest objective and create minimal conflict with other priority wildlife-dependent recreational uses or refuge operations (appendix F).

Make staff available at the contact station to provide rules, regulations, information, and first aid to hunters daily during the opening and closing weeks of archery and rifle seasons, and during weekends throughout hunting season. Staffing would be recruited from the National Bison Range complex, as well as volunteers.

Provide one full-time law enforcement officer to be available in the field during hunting season to inform hunters of rules, regulations, and ethical behavior.

Provide adequate law enforcement staffing during peak hunting periods, in collaboration with MFWP.

Erect appropriate signs to designate closed and restricted areas to reduce the chance of noncompliance and conflicts with nonhunters.

Inform hunters with disabilities (who have obtained a MFWP permit to hunt from a vehicle) about opportunities to access designated refuge management roads and trails, in collaboration with MFWP.

Provide information about opportunities on surrounding lands to allow hunters to plan for a quality experience, in collaboration with PCTC, Flathead National Forest, and MFWP.

Designate the first week of archery season and the first week of rifle season as youth-only hunts for hunters 12–14 years of age, accompanied by an adult at least 21 years of age.

Make law enforcement and other staff available during the youth hunts to provide a positive hunting experience and promote ethical hunting behavior; include volunteers and MFWP personnel, as well as one full-time, refuge, law enforcement officer.

Develop and implement a monitoring system to receive input from hunters about their hunting experiences using direct interviews, registration stations at parking areas and trailheads, and mail-in/drop-off cards left on vehicles, working with region 6's EVS staff and the Office of Management and Budget.

Annually monitor and evaluate the presence of boundary hunting adjacent to closed areas of the refuge. If necessary to discourage this practice, consider these actions: (1) alter hunt area boundaries or habitat; and (2) eliminate parking areas and access roads—to distribute hunters or modify wildlife use patterns in ways that make boundary hunting less appealing.

Obtain information on hunting use in the area, access needs, and hunting goals, in coordination with local hunting groups such as Ducks Unlimited and RMEF.

Evaluate hunting for its impacts on prey populations for the gray wolf; continue to authorize hunting unless it is determined to be in direct conflict with gray wolf survival.

Fishing Objectives

Rationales 145–146 are found in appendix H.

- Determine, within 5 years of CCP approval, the feasibility of restoration of a native sport fisheries...*as in alternative A*
- Carry out planning, funding, evaluation, and implementation of a restoration program for native fisheries...*as in alternative A*
- Provide one fishing event for youth per year...*as in alternative A*
- Allow fishing on 60 percent of waters within refuge boundaries in compliance with MFWP,

within 2 years of CCP approval, to facilitate fishing opportunities for persons of all abilities.

Strategies

Gather baseline resource data, review literature, and develop and implement restoration plans, in collaboration with NRCS, Trout Unlimited, MFWP, and USGS.

Provide one full-time biologist to coordinate refuge participation in sport-fishing partnerships.

Develop at least two accessible fishing sites (figure 13).

Develop an accessible put-in/take-out point at Dahl Lake to minimize disturbance to one point along the shoreline.

Provide one full-time public use specialist and one half-time park ranger to coordinate and conduct the fishing program for youth. Pursue funding sources such as partnerships, grants, and fee programs.

Provide one full-time public use specialist to provide quality fishing opportunities.

Collaborate with off-refuge youth fishing programs (such as MFWP, Hooked on Fishing, and Creston National Fish and Wildlife Center) and recruit community volunteers to help with events held at appropriate fishing sites off the refuge.

To attract more participants and provide more educational opportunities, conduct the youth fishing program during National Fishing Week (early June).

Work with youth programs such as Girl Scouts, Boy Scouts, and schools to encourage a broad spectrum of fishing event participation.

Develop a system to monitor the quality of fishing experiences using comment cards, personal contacts, and registration at fishing sites, working with the Service's region 6 EVS staff.

Obtain information on fishing use in the area, access needs, and sport fishery goals, in coordination with local angler groups such as Trout Unlimited.

Wildlife Observation and Photography Objectives

Rationales 148–151 and 153 are found in appendix H.

- Make contact with 90 percent of visitors...*as in alternative A*
- Encourage the highest standards of ethical behavior...*as in alternative A*
- Permit authorized public access (mostly foot travel) within 2 years of CCP approval on 60–100 percent of the refuge at all times, unless closures are required to protect life, property, or resources, to provide visitors with opportunities to observe and photograph wildlife in its natural

habitat without compromising the resources for which the refuge was established.

- Develop observation and photography sites (one wildlife drive, three accessible wildlife-viewing areas, one accessible viewing platform, two accessible trails, and one accessible observation blind) within 5 years of CCP approval, to develop wildlife observation and photography as the most common wildlife-dependent recreational use.
- Within 3 years of CCP approval and receiving adequate funding and staffing, develop and implement a program to allow for special wildlife observation and photographic opportunities under a regulated permit system to foster an appreciation of special resources.

Strategies

Promote wildlife observation and photography, in collaboration with local groups such as the Flathead Chapter of the Audubon Society and photography clubs.

Map areas of deer and elk use and determine whether additional viewing, photography, or environmental education opportunities can be developed.

Instill ethical observation and photography behavior through presentations, workshops, and field trips, in collaboration with local outdoor groups such as the Flathead Chapter of the Audubon Society, Boy Scouts, and Girl Scouts.

Develop information on ways to successfully view and photograph species of concern while minimizing disturbance.

Open the area between the county road and the South Pleasant Valley Road to public use only on designated trails and roads from May 15 to September 1. Close the area to all public access from September 1 to December 15. Open the area to authorized public use on and off trails from December 15 to May 15 (figure 13).

Open the uplands to authorized public use throughout the year unless closed to protect life, property, or resources.

Provide one full-time biologist work to work with MFWP and NRCS to gather data on wildlife and plants for development of species lists.

Develop and distribute wildlife and bird lists.

Provide one full-time public use specialist and one career-seasonal park ranger to work with the Service's region 6 EVS staff to design, develop, and monitor the wildlife observation and photography program.

Erect and maintain at least three accessible kiosks with maps, rules, and regulations. Post the best,

current observational and photographic opportunities for wildlife (figure 13). Provide maintenance personnel to build and maintain kiosks.

Develop one scenic drive, three accessible viewing sites, one accessible observation platform, two trails (one accessible), and two observation blinds (one accessible) (figure 13).

Develop at least one accessible observation blind in a closed area (figure 13), in collaboration with local wildlife groups such as the Flathead Chapter of the Audubon Society and photography clubs.

Provide one full-time public use specialist to research, develop, and implement a fair and equitable observation blind permit system.

Provide one career-seasonal clerk and one career-seasonal park ranger to assist in implementation of the observation blind permit system.

Pursue funding sources such as partnerships, grants, and fee programs to help defray the costs of developing and implementing a viewing blind permit system.

Provide one full-time and one half-time maintenance staff to construct and maintain parking areas, access points, observation blinds, observation platforms, and trails.

If wolves den or establish a rendezvous site on the refuge, contact wolf recovery biologists to determine if there is a site that can be used for a blind that would allow observation without disturbing the wolves. Allow use of the blind by permit only.

Provide a viewing platform or blind if trumpeter swans occur on the refuge.

Coordinate with local schools, Girl Scouts, Boy Scouts, MCC, and other youth groups to build viewing sites while providing an educational experience for youth.

Develop partnerships with local wildlife groups such as Flathead Chapter of the Audubon Society and photography clubs to gather information on member use of local wildland areas for wildlife observation and photography.

Monitor the wildlife observation and photography program with observation of visitor use, comment cards, car counters, registration at kiosks, and personal contacts.

Monitor the success of the permit program for wildlife observation and photography using comment cards and personal contact.

Interpretation Objectives

Rationales 158–160 are found in appendix H.

- Develop interpretive materials...*as in alternative A*

- Develop interpretive themes...*as in alternative A*
- Ensure that at least 80 percent of visitors understand wetland values and the refuge's contribution to restoration and protection of Pleasant Valley wetlands, within 5 years of CCP approval, to promote public appreciation of natural resources.
- Provide interpretive programs that receive public participation, with yearly increases of at least 10 percent, for the next 10 years, to foster appreciation and understanding of the refuge and its associated wildlife and habitats.
- To reduce disturbance to wildlife and educate the public, develop an interpretive display that informs visitors of the importance of winter range to ungulates, within 5 years of CCP approval.

Strategies

Interpret the mission of the refuge, the National Wildlife Refuge System, and the Service through direct contact of staff with visitors.

Request design assistance from the National Center on Accessibility, the Summit Independent Living Center, and other groups to develop interpretive materials.

Develop and distribute public use tear sheets with clearly written rules, regulations, and a map at accessible points such as the contact station, kiosks, trailheads, wildlife-viewing areas, and parking areas.

Distribute outreach materials for cultural resources in collaboration with local schools, colleges, and civic groups.

Erect and distribute interpretive signs and materials at parking areas, wildlife-viewing areas, trailheads, and the contact station.

Provide two career-seasonal park rangers to develop and present interpretive programs such as walks, talks, and demonstrations.

Recruit volunteers to support interpretive activities—such as staffing the contact station, leading walks, and presenting interpretive programs—in collaboration with neighbors; MFWP; and local wildlife and outdoor groups such as Boy Scouts, Girl Scouts, RMEF, and Flathead Chapter of the Audubon Society.

Coordinate with local schools, Girl Scouts, Boy Scouts, MCC, and other youth groups to build interpretive nature trails while providing an educational experience for youth.

Develop interpretive materials about management of the refuge, the National Wildlife Refuge System, and the Service.

Develop interpretive materials about the history of Pleasant Valley, in collaboration with the CSKT, local history groups, and neighbors.

Provide one full-time public use specialist to develop cultural resource materials to dispense to the public.

Provide one full-time public use specialist to work with region 6's EVS Staff and NRCS to design and develop interpretive displays about wetlands to be erected at the Dahl Lake wildlife-viewing area, along interpretive trails, and at the contact station (figure 13).

Locate an interpretive display at least 0.25 mile from the occupied bald eagle nest site.

Use signs to post areas closed to the public during use by trumpeter swans; develop interpretive material to explain closures for swans.

Provide one public use specialist to work with region 6's EVS staff to develop a handout with observational and photographic and observational opportunities along with successful techniques a comprehensive map, rules, and regulations.

Develop an interpretive panel about the importance of winter range to deer and elk; display the panel seasonally at an interpretive site.

Develop interpretive materials about endangered species, working with region 6's ecological services staff.

Develop and disseminate information on conservation needs of species of concern.

Use letters, phone calls, informational meetings, and door-to-door visits to educate and inform the public on the progress of wolf recovery and the development of livestock protection methods.

Develop an interpretive panel about wolves to be displayed in the visitor contact station or at a kiosk.

Conduct a workshop or field trip on wolves.

Develop interpretive material about Spalding's catchfly to educate the public on identification of the plant, habitat requirements, and why the plant is endangered.

Develop an interpretive display to post at the contact station, kiosks, parking areas, and trailheads to inform users of ethical behavior.

Produce and distribute a tear sheet with a map that designates areas open and closed to hunting, along with all pertinent rules, regulations, and restrictions so hunters can make informed decisions (appendix F).

Develop media contacts and outreach materials to inform the hunting community of hunting opportunities for youth.

Erect interpretive displays at designated parking areas (figure 13) and at the contact station that describe ways to hunt ethically and explain hunting rules, regulations, and restrictions.

Develop a handout about the observation blind permit program as well as maps, rules, and regulations.

Develop a handout with tips for ethical viewing behavior and the advantages of following them, i.e., less disturbance to wildlife provides more viewing opportunities.

Monitor interpretive services through feedback from visitors—observation of visitor's use and personal contacts, comment cards, car counters, law enforcement incidents, and registration at kiosks, observation sites, parking areas, contact stations, and trailheads—as well as resource indicators such as wildlife movements and resource damage.

Evaluate the effects of the interpretive display and observation blind to ensure productivity objectives are still being met for bald eagles.

Develop a public use brochure with a clear map, wildlife-dependent recreational opportunities, rules, and regulations; make brochure available at accessible points within 2 years (figure 13).

Design and develop interpretive displays for the contact station, working with the Service's region 6 EVS staff.

Provide one full-time maintenance staff to build and maintain the wildlife-viewing area and trails.

Develop interpretive materials about wetland restoration within 2 years, in partnership with NRCS.

Develop and design an accessible contact station.

Develop a formal agreement with a cooperating natural history association to provide for sales of educational and interpretive publications.

Environmental Education Objectives

Rationales 161–166 are found in appendix H.

- Develop an extensive environmental education program...*as in alternative A*
- Develop and maintain a lending library...*as in alternative A*
- Collaborate with local educational groups and schools (within 1-hour commuting distance—Pleasant Valley, Marion, and Kalispell), and conduct a minimum of one field trip or environmental education activity per school each year, to foster stewardship of the land, understanding of the refuge vision of conserving natural resources, and experiencing the wonder of natural and cultural resources.

- Develop an accessible campground with 10 campsites for overnight use by the public during the summer (Memorial Day weekend to Labor Day weekend) and to educational groups during spring and fall, within 4 years of CCP approval, to support and encourage quality wildlife-dependent recreational use, and allow students and educators to gain hands-on experience and appreciation of natural resources.

Strategies

Determine environmental educational needs and student numbers within a 2-hour travel radius through collaboration with local schools, including Flathead Valley Community College and the University of Montana's Yellow Bay Biological Station.

Develop an environmental education manual that fulfills both the educational requirements of local and nearby students and the vision and goals of the refuge. Work closely with Pleasant Valley School District.

Develop refuge-based themes such as wetlands, endangered species, and local history and incorporate local, state, and national educational standards into programs, working with local schools.

Promote hunter education for youth by providing educational materials and outdoor education sites, in collaboration with MFWP.

Develop refuge-specific curriculum, lesson plans, and activity guides that complement school curricula and use the refuge as a living laboratory, in collaboration with local schools and region 6's EVS staff.

Become a member of the "Environmental Education Core Group," a coalition of local individuals and groups (private and governmental) involved in environmental education.

Provide one full-time public use specialist to develop, implement, and monitor the environmental education program.

Provide one career-seasonal park ranger to support the environmental education program.

Provide two career-seasonal park rangers to develop and present environmental education programs on- and off-site.

Provide training to environmental education staff at least once a year to attain the knowledge, skills, and abilities to support environmental education at a minimum level.

Recruit and train volunteers to assist in developing and presenting environmental education programs.

Accommodate educational groups whenever appropriate and compatible, to enhance their scientific and biological learning experiences.

Pursue grants that would allow schools to participate in environmental education at the refuge, in coordination with the school boards.

Provide in-school materials to orient students prior to field trips to convey safety messages and describe appropriate field conduct to minimize resource damage.

Develop and present teacher workshops; obtain provider status from the Montana State Office of Public Instruction.

Provide information sheets and wolf education boxes to schools.

Develop a program to be presented to local schools on wolves, their biology, and their importance in the ecosystem.

Conduct at least one field trip or environmental education activity per year in collaboration with the Pleasant Valley and Marion schools to aid in students' biology education.

Conduct at least one hands-on project per year for biology student in collaboration with the Montana Academy to aid in students' biology education, as well as benefit refuge resources.

Work with MFWP, Glacier National Park, Flathead National Forest, and the CSKT to determine what they offer and whom they serve.

Work with local environmental education groups, including Flathead Chapter of the Audubon Society, Glacier Institute, Swan Ecosystem Center, and Crown of the Continent Ecosystem Education Consortium to determine what they offer and whom they serve.

Design and develop an environmental education classroom and laboratory to be located at the contact station (figure 13), working with region 6's EVS staff and the National Center on Accessibility.

Select and develop a designated environmental education site (figure 13), working with region 6's EVS staff and the National Center on Accessibility.

Provide one full-time public use specialist to coordinate campground use with environmental education activities, organize a reservation system for qualified groups, and monitor during use.

Research and obtain materials relevant to natural and cultural resources of the refuge and Pleasant Valley.

Develop and gather environmental education materials, working with region 6's EVS staff and the Service's NCTC, division of educational outreach.

Develop a formal agreement with a cooperating natural history association to provide for sales of educational and interpretive publications.

Establish formal partnerships with school districts and community groups to assist with development, implementation, and promotion of the library.

Develop and maintain a web page with information on environmental education opportunities, lending library materials, Service links, and other resources.

Provide one full-time public use specialist to develop, organize, maintain, and distribute library materials.

Provide one full-time public use specialist with environmental education background to develop and coordinate on-site field trips.

Create a nonprofit group to support environmental education and research at the refuge, in coordination with the Montana State University extension office (Flathead County).

Develop on-site monitoring and research programs for students and educators with an emphasis on wildlife conservation and the importance of wetlands, working with the refuge's biology staff and the NRCS.

Develop partnerships with local schools, Girl Scouts, Boy Scouts, the MCC, and other youth groups to provide an educational experience through building observation blinds, trails, and wildlife-viewing areas.

Develop partnerships with local schools, Girl Scout, Boy Scouts, the MCC, and other youth groups to provide an educational experience through participation in fence removal, facility maintenance, and other habitat management projects.

Seek assistance from the Montana Academy staff in areas that may be beneficial to the refuge as well as to students (e.g., tansy ragwort control).

Monitor the overall effectiveness of the environmental education program by tracking the number of teachers, students, and groups using the resources, and by providing feedback forms to educators.

ADMINISTRATION

Organizational structure, staffing, facilities, equipment, and maintenance are administrative items addressed in the management direction.

GOAL

Provide staffing, funding, and facilities to maintain the long-term integrity of habitats and wildlife resources of Lost Trail National Wildlife Refuge in supporting the achievement of ecosystem and National Wildlife Refuge System goals.

Administration Objectives

The basis for the following objectives and strategies is described in rationales in appendix H.

Operations Objectives

Rationales 169–180 are found in appendix H.

- Form a new complex comprised of Lost Trail National Wildlife Refuge, Swan River National Wildlife Refuge, and the Northwest Montana WMD...*as in alternative A*
- Provide adequate resources and staff...*as in alternative A*
- Provide on-site law enforcement...*as in alternative A*
- Annually use volunteers...*as in alternative A*

Strategies

Provide a separate organizational code and appropriations, by the Service's region 6 office, for future operations, maintenance, and administration of the refuge.

Transfer the annual funding for the National Bison Range, for one full-time employee for the on-site supervisory refuge operations specialist, to the reorganized refuge complex.

Recruit one supervisory refuge operations specialist (GS-12) to provide management operations, oversight, and administration for the refuge and other Service units north of the refuge.

Maintain the on-site, full-time refuge manager (GS-11, supervisory refuge operations specialist) to provide daily supervision and oversight to all activities and operations.

Recruit one maintenance worker (WG-8) to provide adequate resources to operate, maintain, and repair facilities.

Develop a web page to describe available maintenance resources and to monitor and track materials.

Recruit one full-time wildlife biologist (GS-11) to be stationed at the refuge for coordination of the biological program.

Hire one full-time administrative support assistant (GS-4/5) to provide daily on-site clerical and administrative support.

Recruit one outdoor recreation planner (GS-11) to provide quality, wildlife dependent, consumptive and nonconsumptive public use opportunities.

Establish a volunteer coordinator position within 3 years of CCP approval, to build partnerships and

provide resources for recreational use, which will foster public appreciation and support for the vision of the refuge and mission of the Refuge System.

Coordinate and plan equipment needs with the maintenance supervisor and project leader at complex headquarters through the RONS and MMS processes, to acquire appropriate equipment to maintain facilities and habitats (e.g., tractor, mower, backhoe, pickup, dump truck, motor boat, vehicle hoist, equipment repair tools and diagnostics, and carpentry tools and machinery).

Maintain equipment in a safe and efficient operating status.

Replace and add equipment through the RONS planning process as needed (due to normal deterioration and needed repair, and as staffing is increased).

Provide microscopes, and laboratory and other necessary equipment to support the environmental education curriculum.

Provide field guides, binoculars, and spotting scopes to assist with census work.

Provide VCRs, televisions, and slide projectors to preview audiovisual materials.

Provide satellite capacity for the Service's "distance from learning" program.

Communicate with MFWP staff to maintain adequate levels of law enforcement on and adjacent to the refuge.

Provide one three-quarter-time volunteer coordinator to recruit, develop, organize, and monitor volunteer programs.

Facilities Objectives

Rationales 186–191 are found in appendix H.

- Provide adequate administrative and maintenance facilities...*as in alternative A*
- Identify and remove unnecessary structures...*as in alternative A*
- Restore and protect 28 miles of graveled and two-tracked grass roads and travel lanes for the duration of the CCP, to provide an efficient and safe road system for administrative and public use.

Strategies

Modify a portion of the horse arena to provide a visitor center, educational labs, and administrative space; submit as a RONS project.

Modify the horse arena to provide administrative space, a maintenance shop, and equipment storage; submit as a RONS project to modify the building

and acquire equipment and tools including a phone system, computers, work stations, filing and storage cabinets, a vehicle lift, a vehicle wash bay, equipment repair tools, carpentry tools, and metal working tools.

Develop environmental education and visitor information sites at strategic locations; submit as a RONS project.

Coordinate with Flathead Wildlife, Inc. to assist with building parking areas for designated public use activities and assist with habitat management projects.

Develop a recreational vehicle trailer site to support a volunteer program.

Work with the Service's region 6 staff (education and visitor services) on design and accessibility requirements.

Repair and maintain facilities, buildings, fences, and roads on an "as-needed basis."

Coordinate restoration and maintenance of PCTC easement roads according to terms of the existing cooperative road easement.

Coordinate with the PCTC where shared-easement road maintenance is applicable.

Remove unnecessary facilities and structures including interior fences, east cattle station structures, guest cottage building, ranch office building, and feedlot corrals.

Complete facility maintenance and fence removal through assistance from the MCC and Landmark Volunteers.

Continue the annual fence removal project (RMEF challenge cost-share grant initiated in 2000).

Recruit volunteers for projects such as removal of the east cattle station, clean up or removal of other facilities, monitoring, and public use activities.

Develop and implement a RONS and MMS projects list to provide necessary public use-dependent equipment and facilities.

PARTNERSHIPS

The management direction for partnerships addresses support to most refuge programs.

GOAL

Promote and develop partnerships with adjacent landowners, public and private organizations, and other interested individuals to preserve, restore, and enhance a diverse and productive ecosystem of which Lost Trail National Wildlife Refuge is an integral part.

Partnership Objectives

The basis for the following objectives and strategies is described in rationales 192–200 and 202, found in appendix H.

- Partner with nongovernmental organizations...*as in alternative A*
- Develop a “friends group”...*as in alternative A*
- Share law enforcement responsibilities with MFWP...*as in alternative A*
- Meet once a year with PCTC, RMEF, Flathead and Lincoln counties weed departments, and the USDA Forest Service to maintain partnerships...*as in alternative A*
- For the period of this CCP, collaborate with the Flathead County Road Department regarding refuge signage and potential cooperative road maintenance and possible relocation issues concerning Pleasant Valley Road...*as in alternative A*
- Continue issuing annual special-use permits with the USDA Forest Service for use, maintenance, and invasive plant control on refuge road North 1019...*as in alternative A*
- Continue coordination with Bonneville Power Administration regarding the power line easement...*as in alternative A*
- Collaborate with the Retired Senior Volunteer Program to provide assistance with refuge maintenance, restoration, and public use programs, and provide volunteers an opportunity to stay and work within the Pleasant Valley.

Strategies

Collaborate with Partners for Fish and Wildlife to continue restoration on the refuge and adjacent lands.

Work with the Flathead County extension office to develop a “friends group” and a direction of focus.

Operate under the statewide agreement with the Montana DNRC for fire suppression on the refuge.

Determine how to minimize any negative effects resulting from modifications to refuge portions of Pleasant Valley Creek on native fisheries downstream in Fisher River, through collaboration with MFWP and NRCS.

Coordinate fire suppression issues and protocols at annual meetings with Montana DNRC.

Continue coordination with PCTC regarding maintenance of existing fence lines.

Control beaver activities that impact Pleasant Valley Road, i.e., flooding, through coordination with MFWP.

Issue a special-use permit to the USDA Forest Service for use of road 1019 for logging activities on land north of the refuge.

Continue to abide by rules and agreements in the existing power-line easement document. Annually review the easement document and coordinate all refuge activities that may affect the power line with Bonneville Power Administration.

Provide one three-quarters-time volunteer coordinator to implement the “friends program.”

Coordinate closely with the NRCS on stream and wetland restoration throughout the WRP.

Collaborate with USGS, Northern Rocky Science Center, on management of wetlands.

Coordinate protection of species of concern with conservation easement partners such as the NRCS, WRP, MFWP, Montana Land Reliance, The Nature Conservancy, and Audubon Society.

Seek partners and volunteers to design and fund methods, and assist in determining production of waterfowl.

Share the expense and workload of aerial pair and brood counts for waterfowl with MFWP; Avista Utilities; and the CSKT.

Seek partners such as MFWP, PCTC, Defenders of Wildlife, Flathead and Kootenai national forests, and the Great Bear Foundation, for grizzly bear conservation.

Coordinate and collaborate with Montana DNRC to maintain Spalding’s catchfly.

Meet with “friends group” volunteers at least twice a year to determine group direction and assist where appropriate.

Use students to assist with fence removal or various other habitat management projects.

Maintain adequate levels of law enforcement assistance on or adjacent to the refuge during hunting seasons for big game and upland game birds through continued communication with MFWP.

Provide one full-time law enforcement officer to protect natural resources by coordinating with MFWP.

ALTERNATIVE C

Habitats are restored. Natural ecological processes drive habitat functions and wildlife populations.

Public use is limited, with wildlife observation, photography, and interpretation occurring along roads and trails. Informed visitors do not disturb plants or wildlife.

Staffing is minimal, and facilities are improved.

Partnerships accomplish restoration.

RIPARIAN HABITAT

Stream channels and associated vegetation are addressed in the management direction for riparian habitat. Water control structures that affect the functioning of riparian habitat, as well as fish passage, are addressed.

GOAL

Restore, enhance, and maintain a mixed deciduous and coniferous riparian habitat to support indigenous wildlife species and perpetuate the ecological integrity of the Fisher River watershed.

Riparian Habitat Objectives

The basis for the following objectives and strategies is described in rationales 1–4, found in appendix H.

- The Service will maintain coordination and collaboration for restoration of the stream vegetation and stream meander on the WRP easement...*as in alternative A*
- Enhance the integrity of the Pleasant Valley Creek restoration project with fish passage...*as in alternative A*
- Restore Pleasant Valley Creek to its natural form and function within 1 year of CCP approval, with a corridor of native vegetation, to decrease water temperatures and reduce siltation.
- Restore diverse, naturally occurring riparian plant communities while maintaining a minimum of the current acreage of aspen (70 acres), willow (13 acres), and birch and alder (6 acres), within 5 years of CCP approval, to increase vegetative diversity and stabilize soil.

Strategies

Study stream characteristics and the biological potential of Pleasant Valley Creek, in collaboration with NRCS; MFWP; and Trout Unlimited.

Determine the most efficient stream design to decrease water temperatures and reduce siltation for the benefit of Columbia redband trout and westslope cutthroat trout, in collaboration with MFWP.

Establish sites for riparian vegetation restoration based on soils, water levels, and wetland classification. Review literature for water regimes and soil types required for willow, alder, and birch.

Plant native vegetation in the Pleasant Valley Creek corridor.

Determine historical fish presence through review of historical records obtained by Trout Unlimited through interviews with residents and research documentation.

Remove fish barriers in Pleasant Valley Creek downstream from the refuge, in collaboration with NRCS and private landowners.

Complete riparian habitat enhancement and restoration of native fish, in collaboration with NRCS, MFWP, Partners for Wildlife, Trout Unlimited, and USGS.

Provide one full-time biologist to monitor fish recovery and populations.

Conduct surveys for migratory birds, songbirds, amphibians, and vegetation before and after restoration efforts in refuge ponds and Pleasant Valley Creek, in collaboration with NRCS and volunteers.

Annually monitor for effects of any restoration project on willow, birch, and alder.

Monitor water temperature and sediment load in streams, in collaboration with Trout Unlimited.



W.F. Kubichek/USFWS

Common snipe have been sighted in refuge habitats.

WETLAND HABITAT

Lakes, bogs, and other saturated wetland areas are addressed in the management direction for wetland habitat.

GOAL

Provide breeding, resting, and feeding habitat for wetland-dependent species of northwestern Montana by restoring, maintaining, and enhancing a mosaic of lake, semipermanent, seasonal, temporary, and saturated wetlands.

Wetland Habitat Objectives

The basis for the following objectives and strategies is described in rationales 8–11 and 16, found in appendix H.

- Restore Dahl Lake complex water levels...*as in alternative A*
- Conduct a wetland study in the Dahl Lake complex...*as in alternative A*
- Restore natural wetland vegetation in Dahl Lake wetland complex...*as in alternative A*
- Inventory for fens (alkaline bogs) ...*as in alternative A*
- Restore drained wetlands, remove all structures, and allow drained wetlands to recharge and function with naturally occurring seasonal fluctuations and not hinder subsequent levels of emergent vegetation, within 7 years of CCP approval, to provide invertebrate foods and emergent vegetation for foraging habitat and nesting and brood cover.

Strategies

Restore or increase water-holding capabilities in wetlands on the WRP easement, e.g., plug ditches, in coordination with the NRCS.

Fill the drain ditch (Meadow Creek) coming out of the west end of Dahl Lake with off-site spoils that remain on-site, and by trucking in spoils to fill the ditch back west to the location of the old water control structure (figure 3).

Use prescribed fire in early spring, late summer, or fall (Howard 1996, Tirmenstein 1988) to promote quaking aspen for rejuvenation of existing stands or increase coverage of aspen.

Monitor for deteriorating aspen stands as defined by low density of stems that are younger and smaller in size, and with poorer form and higher crown-to-stem ratios than healthy stands (Schier and Campbell 1978).

Monitor effects of using prescribed fire in riparian habitat and use adaptive resource management.

Monitor wetland vegetation coverage response to recharge every third year; map in the GIS.

Annually monitor vegetative response by measuring habitat coverage; map in GIS.

Survey wet meadows for dominant plant species and presence of peat; measure pH of soil in suspect areas.

Annually conduct pair-count surveys for water birds to monitor use of wetlands pre- and post-refill.

GRASSLAND HABITAT

This management direction is for the diverse grasslands covering the majority of the refuge.

GOAL

Restore, enhance, and maintain Intermountain grasslands, with an emphasis on native bunchgrass prairie to provide habitat for migratory birds, species of concern, and associated wildlife species.

Grassland Habitat Objectives

The basis for the following objectives and strategies is described in rationales 18–21 and 27, found in appendix H.

- Fence and post the entire refuge boundary...*as in alternative A*
- Develop soil descriptions...*as in alternative A*
- Maintain native, upland grasslands (1,500 acres) with dominant grass species of Idaho and rough fescue and western wheatgrass (figure 4), within 10 years of CCP approval, in appropriate composition percentages dependent on soil types [vigorous Idaho fescue with an average of 8–12 flower stalks/plant, 7.9–8.7 inches maximum leaf length/plant, and 2.2–2.7 square inches live basal area (Mueggler 1970, 1975) and average 5–9 inches leaf height (Pond 1960); and rough fescue with average 9.8–11.8 inches leaf height (McLean and Wikeem 1985)], to restore and maintain vigorous bunchgrass uplands for nesting migratory birds and forage for other wildlife.
- Evaluate grassland communities to determine ecological trend and similarity to climax community, in management units 10–15, 19, and 20 (figures 2 and 4), and define needs and opportunities in a habitat management plan developed within 2 years of CCP approval.

Strategies

Fence and post the refuge boundary; use staff from the National Bison Range complex or contracted personnel.

Use wildlife-friendly fencing in areas of high wildlife use, where feasible.

Survey or find markers in areas of uncertainty for the refuge boundary.

Use existing soils layers to determine which soils have not been classified.

Sample soils and describe associated climax vegetation for each unclassified type; perform through a request to the NRCS.

Determine native species composition according to soil types; use NRCS technical guides.

Determine the best restoration method and plant species of replacement; consult with experts and review literature.

Conduct habitat management monitoring every 2 years to determine current habitat condition.

Rest and prescribed fire may be used as habitat management tools once monitoring demonstrates native grassland targets have been achieved.

Monitor habitat management and compare to climax grassland communities as defined by soil type within 2 years of CCP approval.

FOREST HABITAT

Coniferous and deciduous forests are addressed in the management direction for forest habitat.

GOAL

Enhance and maintain Douglas-fir, ponderosa pine, aspen, and cottonwood forested habitats within the context of the Fisher River watershed for migratory birds, species of concern, and other associated wildlife species.

Forest Habitat Objectives

The basis for the following objectives and strategies is described in rationales 29–30, found in appendix H.

- Identify forest coverage types...*as in alternative A*
- Evaluate past use and historical fire regimes of forest types, and determine how fire can best be reintroduced to the ecosystem, within 5 years of CCP approval, to maintain a mosaic of open ponderosa pine with areas of Douglas-fir, lodgepole pine, larch, and spruce as defined by soil, slope, aspect, and moisture, to conserve forest and the biological integrity of the ecosystem.
- Manage forest as a natural component of the ecosystem without manipulation, unless deemed necessary for human safety or to protect neighboring resources to maintain natural habitat for Canada lynx in the future.

Strategies

Evaluate forest stand characteristics (age structure and tree density) relative to past land use, historical fire regime, soil, slope, aspect, and moisture.

Review forest lands for habitat needs by rare, threatened, and endangered species.

Protect lynx denning cover by creating firebreaks to prevent natural fire from spreading in or out of areas where fuels have built up in areas managed for Canada lynx denning.

Review forest lands on and near the refuge for threats from development.

Determine opportunities for establishing a forest legacy easement, through discussions with partners.

Acquire a forest legacy easement to protect forests adjacent to the refuge and within the Pleasant Valley from development, in collaboration with all partners.

Determine which fire regime criteria would promote desired forest characteristics, through a literature review.

Classify forest vegetation into National Vegetation Classification Standards; map in the GIS database.

INVASIVE PLANTS

Prevention and control of nonnative, invasive plants are addressed in the management direction for invasive plants.

GOAL

Native plant communities, composition, occurrence, and density exist without degradation by invasive plants.

Invasive Plant Objectives

The basis for the following objectives and strategies is described in rationales 36–39, found in appendix H.

- Develop and implement an invasive plant management plan...*as in alternative A*
- Annually eradicate and maintain 75–90 percent control of tansy ragwort...*as in alternative A*
- Conduct a surveillance program for new infestations of invasive plants...*as in alternative A*
- Determine the best method possible and begin restoration of 100 percent of the introduced creeping meadow foxtail (figure 4) to native grass and sedges, within 1 year of CCP approval, to provide nesting habitat for blue-winged teal and mallard during the restoration process.
- Reduce spotted knapweed and other invasive plants to a level of 10 percent or less of overall grassland area, within 3 years of CCP approval, to maintain native vegetation for wildlife forage, cover, and nesting.

Strategies

Evaluate invasive plant infestations and control efforts since refuge establishment.

Evaluate invasive plant infestations within Pleasant Valley for priority areas of control by each partner.

Determine appropriate, effective control methods, e.g., mowing, chemical, biocontrol, and prescribed fire; consult with experts.

Determine the best restoration method and plant species of replacement in invasive plant infestations; consult with experts and review literature.

Gather information about cumulative impacts of chemical, biocontrol, and prescribed fire effects on invasive plants and on native vegetation response; review literature.

Determine the best method of reducing reed canarygrass, including use of fire, disking, and grazing.

Evaluate soils and water regime for optimum sites for reed canarygrass control.

Use the GIS to predict areas at greatest risk of new invasions and develop early detection and prevention measures.

Share GIS layers of invasive plant infestations with PCTC and the USDA Forest Service.

Apply integrated pest management for spotted knapweed, consisting of: (1) proper spring and fall chemical applications; (2) mechanical mowing where practical, prior to seed head production; and (3) release of appropriate biocontrol agents, including seed head gall flies and other proven biocontrol agents.

Use hand pulling, hand spraying, and ATVs for herbicide application in areas within 330 feet of Spalding's catchfly populations.

Evaluate the target species selectiveness of any biocontrol species prior to release.

Treat new invasions of tansy ragwort in late July and early August by bagging flower heads and burning them, and spraying rosettes with chemicals such as Transline or Tordon.

Use herbicides and a prescribed fire program to eradicate invasive plants and maintain vigorous native grass and forb components.

Survey proposed spray areas for Spalding's catchfly prior to herbicide application.

Coordinate invasive plant control in Pleasant Valley by meeting at least once per year to share information and discuss control strategies: (1) with

PCTC for spotted knapweed; and (2) with PCTC and the USDA Forest Service for tansy ragwort.

Continue to discuss, with partners, alternatives for invasive plant control within the Pleasant Valley.

Develop a habitat management plan using prescribed fire and herbicides to maintain and restore native grassland communities.

In areas of heavy spotted knapweed infestation, where grass response will be limited or nonexistent, revegetate with seeding of native grasses following herbicide application.

Map sites of invasive plant treatment each year in the GIS.

Develop a strategy with partners for control of tansy ragwort and how to prevent it from becoming a dominant plant species within the Pleasant Valley.

Attain assistance with tansy ragwort control from the Tansy Trust Fund Grant program, as well as from the Service's challenge cost-share grants.

Attain assistance with invasive plants (applications and monitoring) by pursuing grant funding through the project advisory committee, e.g., RMEF grants, until the refuge can support its own needs for control.

Mitigate disturbance on refuge roads with invasive plant control and reseeded of native species through the ongoing memorandum of understanding with PCTC.

Limit off-road vehicle travel and wash the undercarriages of vehicles that access off-road areas.

Determine the extent of infestation of sulfur cinquefoil; create a baseline map.

Monitor infestation rates and effectiveness of control efforts; annually map the extent of infestation of spotted knapweed and tansy ragwort in GIS.

Identify locations of new infestations of tansy ragwort; map locations and collaborate with the state coordinator for mapping records for neighboring PCTC land.

Monitor reed canarygrass control efforts, vegetation coverage, and use adaptive management.

Monitor plant species occurrence and percent cover, along with wildlife use, pre- and postrestoration.

Gather information about invasive plant occurrence; inform all Service employees that may work on the refuge about plant and habitat characteristics of invasive plants to get help finding invasive plants during normal field duties.

Conduct walk-through surveys for invasive plants with volunteers to look for new infestations.

MIGRATORY BIRDS

Management direction for migratory birds addresses waterfowl, other water birds, shorebirds, and Neotropical migratory birds.

GOAL

Preserve, restore, and enhance the ecological diversity and abundance of migratory birds of the Intermountain West forest, wetland complexes, riparian habitat, and bunchgrass prairie.

Migratory Bird Objectives

The basis for the following objectives and strategies is described in rationales in appendix H.

Water Bird Objectives

Rationales 42–44 and 49–50 are found in appendix H.

- Annually monitor goose populations...*as in alternative A*
- Monitor levels of nesting and production of ducks, and maintain or increase production for the life of the CCP, to support population goals of the North American Waterfowl Management Plan.
- Evaluate biological potential for shorebirds and marsh birds (including American bittern, sandhill crane, long-billed curlew, and black-crowned night-heron), presence, and nesting; and protect marsh habitat from disturbance during nesting; within 7 years of CCP approval, to preserve biological integrity.

Strategies

Set priorities for and limit special-use permits.

Determine vegetative substrate available for duck forage in late summer and fall.

Increase duck production through habitat restoration, followed by natural processes.

Protect duck nesting from disturbance.

Map availability of dense, tall (>23.6 inches) emergent vegetation for bittern, tern, and redhead nesting cover.

Prohibit public use in marsh habitat during the nesting season.

Limit administrative disturbance in marsh habitat during the nesting season.

Prohibit haying, mowing, and grazing immediately preceding and during the nesting season of shorebirds and marsh birds.

Continue duck pair counts and implement duck brood index survey.

Monitor for marsh birds during duck pair and brood counts, Neotropical migratory bird surveys, and with playbacks.

Other Migratory Birds Objectives

Rationales 54, 58, and 60 are found in appendix H.

- Monitor Neotropical migratory birds...*as in alternative A*
- Develop a conservation plan for Neotropical migratory birds on interagency and private lands in the Pleasant Valley area within 10 years of CCP approval, to preserve a variety of habitats on a landscape level that will maximize species diversity and viability.

Strategies

Conduct Neotropical migratory bird surveys, and nest success monitoring in forest, shrubland, cottonwood, and aspen habitats.

Continue existing Neotropical migratory bird surveys along Pleasant Valley Creek and the refuge road system with staff or volunteers.

Conduct additional surveys and nest success monitoring for Neotropical migratory birds to more closely examine the effects of the Pleasant Valley Creek restoration project, working with NRCS, partners, and volunteers.

Use effective education, communication, and carefully designed mechanisms for planning, cooperation, and coordination for Neotropical migratory bird conservation.

OTHER WILDLIFE

Resident wildlife including large and small mammals, resident birds, amphibians, and reptiles are addressed in the management direction for other wildlife.

GOAL

Restore and maintain resident and endemic wildlife populations of northwestern Montana to maintain and enhance species diversity of Lost Trail National Wildlife Refuge and Pleasant Valley.

Other Wildlife Objectives

The basis for the following objectives and strategies is described in rationales in appendix H.

Large Mammal Objectives

Rationales 61–67 are found in appendix H.

- Maintain elk, deer, and moose populations...*as in alternative A*
- Modify or remove all nonessential fences...*as in alternative A*

- Develop a plan for chronic-wasting disease...*as in alternative A*
- Annually monitor large mammal abundance...*as in alternative A*
- Open the refuge to public use only on designated trails from December 15 through April 1 ...*as in alternative A*

Strategies

Improve habitat quality through invasive plant control, native plant restoration, prescribed fire, and grazing.

Hire a biologist to monitor and evaluate wildlife population dynamics, and to conduct necessary control.

Hire biological staff or use the biologist from the National Bison Range complex, along with volunteers, to conduct monitoring.

Construct temporary fences (electric or barbless wire) if needed.

Identify fence locations and determine their importance for refuge management; map using a global positioning system.

Remove all fences (interior only) or modify fences for wildlife-friendly movement. Remove either the top and bottom wire or two bottom wires so the bottom wire is at least 18 inches off the ground; remove stays to enhance movement or use lay-down wires.

Incorporate additional gates into fences where it is not feasible to modify them; keep gates open when livestock are not present in grazing units.

Develop a system to estimate deer and elk populations on the refuge; review literature for current, valid methods.

Determine best management practices to use in response to monitoring data on deer and elk populations and how they are being affected by refuge management or how they are affecting the refuge; coordinate with MFWP. Apply adaptive management, e.g., modify hunting seasons, or use fire, invasive plant control, or grazing to improve forage.

Determine areas of large mammal concentrations (winter range) and avoid public use in these areas.

Determine if large mammal resource damage is a result of local factors or reflects an ecosystem phenomenon, through comparison of deer and elk population trends on the refuge with MFWP trend data for the ecosystem.

Coordinate proposed prevention, surveillance, research, and control actions for chronic-wasting

disease in cooperation with state wildlife and agriculture agencies.

Conduct outreach to surrounding communities and communication to refuge visitors regarding chronic-wasting disease and disease management.

Remain alert to potential threats from chronic-wasting disease or other diseases.

Educate the public on how to minimize winter disturbance and stress to large mammals during recreation activities.

Evaluate all public uses for their effects on herd numbers and distribution of wildlife on the refuge.

Monitor deer, elk, and moose use of refuge habitats to determine high-use areas and design public use activities around these areas.

Determine baseline populations of large mammals; monitor for 3 years and consult MFWP.

Monitor abundance and presence of elk (in the winter), deer (in the summer), and moose (in the spring or summer).

Determine the cause of any decrease below 75 percent of current herd sizes for deer, elk, and moose; determine if modifications in management are warranted. Monitor deer and elk to determine high-use areas and design public use activities around these areas.

Categorize the vegetation in areas of high use by deer, elk, and moose; map locations and categories.

Ensure deer and elk are staying within the carrying capacity; evaluate areas of high use for browse-line impacts.

Evaluate the effects of public use in areas of habitat damage to determine if overuse of specific habitats by deer and elk is a result of wildlife response to disturbance.

Conduct a passive surveillance program for clinical signs of chronic-wasting disease or other health problems (may lead to a targeted surveillance based on results); conduct monthly, opportunistic observations of deer and elk.

Small Mammal Objectives

Rationale 70 is found in appendix H.

- Monitor Columbian ground squirrel habitat acreage...*as in alternative A*

Strategies

Determine ground squirrel activity centers; map by size of population and damage to vegetation in the GIS.

Determine an acceptable baseline level for habitat affected by ground squirrels and their population numbers, using initial data.

Maintain ground squirrel numbers within 20 percent of a baseline determined after initial monitoring and literature research.

Determine changes in acres affected by ground squirrels; monitor ground squirrel activity on a 3- to 5-year basis.

Resident Bird Objectives

Rationales 72–75 and 77 are found in appendix H.

- Annually inventory and monitor resident (nonmigratory) birds...*as in alternative A*
- Develop prescribed fire plans that would help meet habitat requirements of the flammulated owl and black-backed woodpecker in woodland and forest habitat, within 5 years of CCP approval, to conserve the biological integrity of the ecosystem.

Strategies

Determine endemic species, habitat requirements, and feasibility of restoration; consult the Montana Natural Heritage Association, Montana Atlas of Terrestrial Vertebrates (Hart et al. 1998), and other experts.

Limit disturbance within at least 0.5-mile from any occupied golden eagle nest; consider temporary implementation of alternate routes of public use or management.

Determine potential effects of management activities to species listed as priority for conservation by MPIF Plan (Casey 2000) or the Service's office of migratory bird management (1995).

Continue annual Neotropical migratory bird surveys and detect all resident and migratory birds through addition of one survey route in the uplands.

Inventory for Montana Bird Conservation Plan priority 1 species such as flammulated owls and black-backed woodpeckers.

Implement an owl survey once a year for the next 3 years, using volunteers.

Monitor for the arrival and nesting of golden eagles.

Record any incidental sightings of bird species on the refuge.

Amphibian and Reptile Objectives

Rationales 78–79 and 81–82 are found in appendix H.

- Biannually conduct surveys for bullfrogs...*as in alternative A*

- Determine the presence of amphibians and reptiles (through inventories of representative samples of all habitats) to gather baseline and trend data; and establish habitat guidelines for all species found, within 3 years of CCP approval, to conserve the biological integrity of the ecosystem.
- Determine what species of amphibians and reptiles are endemic to the refuge and develop restoration plans within 6 years of CCP approval, to conserve the biological integrity of the ecosystem.

Strategies

Develop habitat guidelines for amphibians and reptiles; consult experts.

Learn survey techniques and design surveys; coordinate with the “Amphibian Research and Monitoring Initiative” team.

Teach all staff to identify bullfrogs.

Contact local experts about eradication procedures for bullfrogs.

Collaborate with amphibian and reptile biologists to determine the effects of implementing the habitat management plan may have on the boreal toad.

Hire biological staff to conduct monitoring and control, if necessary, for bullfrogs.

Report amphibian data to the regional level, i.e., “Amphibian Research and Monitoring Initiative” team, to support ecosystem-level monitoring.

SPECIES OF CONCERN

This management direction addresses wildlife listed by state or federal agencies as threatened and endangered (or proposed or candidate for listing), sensitive, rare, or species of concern.

GOAL

Contribute to the conservation, enhancement, and recovery of endangered, threatened, and species of concern populations in Lost Trail National Wildlife Refuge and Fisher River watershed.

Species of Concern Objectives

The basis for the following objectives and strategies is described in rationales 83–84 and 86, found in appendix H.

General Objectives

- Document sightings and locations of rare or unusual plants and wildlife...*as in alternative A*
- Develop a conservation easement program (preliminary project proposal), for large carnivores...*as in alternative A*

- To enhance the Pleasant Valley ecosystem, within 10 years of CCP approval, monitor and research species of concern and develop restoration or enhancement plans for any species that have historically had a presence in the Pleasant Valley area.

Strategies

Determine which species are endemic to the area, working with the Service's endangered species biologists, MFWP, and the Montana Natural Heritage Program.

Determine the feasibility of restoring endemic populations that no longer occur on the refuge, e.g., sharp-tailed grouse.

Prohibit livestock grazing as needed in habitat for the gray wolf and Canada lynx.

Do not use livestock grazing as a management tool within 1 year of CCP approval.

Promote complementary management for rare species off-refuge by working with neighbors.

Develop a conservation strategy with PCTC to protect their lands from future development.

Hire a biologist to be stationed at the refuge to coordinate grizzly bear, Canada lynx, and black tern management; and monitor the trumpeter swan reintroduction.

Seek funding from the Land and Water Conservation Fund for a conservation easement program.

Record sightings of rare species during routine staff and volunteer duties.

Conduct surveys to determine which endemic species are currently present on the refuge.

Survey for owls, rails, and rare species; and monitor bald eagle nests and black tern nesting colonies; request assistance from Audubon volunteers.

Develop a preliminary project proposal for the conservation easement program, delineating a focus zone and priority areas.

Grizzly Bear Objectives

Rationales 87–90 are found in appendix H.

- Protect the grizzly bear habitat linkage zone...*as in alternative A*
- Prohibit livestock grazing if a grizzly bear is within 1 mile...*as in alternative A*
- To ensure compliance with the ESA and to support the mission of the Service, minimize conflicts with and disturbance to grizzly bears...*as in alternative A*

- To improve support for and understanding of grizzly bears, the refuge's public use staff (or partners) will conduct or coordinate one workshop or field trip per year and will develop at least one interpretive display and one information sheet...*as in alternative A*

Strategies

Evaluate current grizzly habitat components of Pleasant Valley; use the GIS and consultation with neighbors.

Determine the effects that proposed management actions would have on grizzly bears; consult with biologists.

Identify and secure funding for conservation easements in the grizzly linkage zone; coordinate with the Interagency Grizzly Bear Coordination Team, the Flathead and Kootenai national forests, PCTC, MFWP, Montana DNRC, NRCS, and private landowners.

Close areas for grizzly bears through the use of signs and other informational material; enforce closures through law enforcement patrols.

Limit administrative activity in areas of grizzly bear activity.

Prevent livestock–bear competition for spring forage by restricting livestock grazing if a grizzly bear is within 1 mile of the refuge.

Close designated areas to all public access (based on each particular situation) when one or more grizzly bears are within 1 mile of the refuge.

Work with the interpretation and education subcommittee of the Interagency Grizzly Bear Committee.

Follow guidelines of the Grizzly Bear Compendium (LeFranc et al. 1987) to provide habitat and security within the Pleasant Valley area.

Prohibit hunting of ground squirrels unless it becomes biologically necessary to protect resources.

Prohibit black bear hunting.

Monitor the occurrence and location of grizzly bears in Pleasant Valley, in collaboration with private landowners, MFWP, Interagency Grizzly Bear Coordination team, USDA Forest Service, and PCTC.

Gray Wolf Objectives

Rationales 93–94 and 101–102 are found in appendix H.

- Evaluate the effects of management decisions on gray wolves...*as in alternative A*

- Monitor and maintain habitat and sufficient native prey to support one pack of gray wolves...*as in alternative A*
- Prohibit livestock grazing when a wolf pack is present in Pleasant Valley...*as in alternative A*

Strategies

Determine the effects that proposed management actions would have on gray wolves; consult with biologists.

Prohibit public access within 1 mile of any active wolf den or rendezvous site.

Prohibit all public access on designated refuge areas if wolves are in the Pleasant Valley.

Close the refuge to public access within 1 mile of any active wolf den or rendezvous site from May 1 to July 1.

Close designated areas of the refuge to all public access from December 1 to April 15 if wolves are in the Pleasant Valley watershed.

Prohibit sport trapping.

Maintain or increase deer, elk, and moose populations by improving habitat through the control of invasive plants using biological, mechanical, and chemical methods.

Canada Lynx Objectives

Rationales 104 and 106 are found in appendix H.

[No specific objectives other than those for Canada lynx habitat under Forest Habitat.]

Strategies

Allow natural processes to occur such as fire and disease outbreaks in habitat for Canada lynx.

Prohibit timber harvest in habitat for Canada lynx.

Determine areas where wildfires will be permitted to burn and delineate boundaries of where fires should be stopped within habitat for Canada lynx.

Prohibit sport trapping for the life of this CCP, to prevent accidental death of lynx.

Patrol the area using the seasonal law enforcement position for the refuge, staff from the National Bison Range complex, and MFWP wardens.

Bald Eagle Objectives

Rationales 107–110 and 114–115 are found in appendix H.

- Annually monitor bald eagle nesting and protect habitat...*as in alternative A*
- Remove carrion from roadsides...*as in alternative A*

- Maintain suitable, bald eagle foraging habitat, minimize disturbance within key areas, and maintain the integrity of the breeding area between 0.5 and 2.5 miles of any occupied eagle nest until the bald eagle is delisted and 5 years thereafter, to enhance bald eagle recovery.
- Identify and protect bald eagle foraging habitat outside the 2.5-mile home range of known nesting eagles, within 5 years of CCP approval, to maintain adequate prey and minimize disturbance.
- Identify and manage suitable, unoccupied, bald eagle nesting habitat following the Habitat Management Guide for Bald Eagles in northwestern Montana (MBEWG 1991), within 5 years of CCP approval, to enhance bald eagle recovery.
- To promote bald eagle recovery and nesting success off-refuge, develop an interpretive handout and provide one outreach program per year about living with eagles and minimizing disturbance.

Strategies

Locate suitable bald eagle habitat; use vegetation coverage maps.

Identify bald eagle foraging habitat by direct observation and habitat classification mapping.

Delineate and protect key use areas of bald eagles (foraging and perching) to limit disturbance.

Maintain the prey base in key bald eagle areas.

Evaluate all management decisions for their effects bald eagles prior to implementation, until foraging habitat can be identified.

Evaluate all management decisions for their effects bald eagles prior to implementation to ensure that preferred nesting and feeding habitat characteristics are maintained.

Protect bald eagles by evaluating proposed pesticide use before application.

Protect identified bald eagle areas from contaminants and physical hazards.

Hire a biologist or use volunteers to evaluate habitat for suitability for bald eagle nesting.

Hire a biologist to evaluate or facilitate the evaluation of the effects of existing power lines on bald eagles.

Prohibit sport trapping.

Follow the hunt plan (2002) that limits hunting to deer, elk, moose, turkey, and grouse and designates a closed area in which the existing bald eagle nest is located.

Design habitat alterations to ensure that prey base and important habitat components such as perch trees are maintained or enhanced for the bald eagle.

Design and regulate permanent developments such as viewing areas, trails, parking lots, and kiosks to minimize disturbance and avoid conflict with key use areas for the bald eagle, between 0.5 and 1 mile of an active nest.

Monitor bald eagle nest success to ensure that breeding areas have at least 65 percent nest success, and at least five young fledged during the preceding 5 years.

Monitor occupied bald eagle nest sites to determine fledgling success, using staff or volunteers.

Conduct surveys in a noninvasive manner after the hatching of bald eagle young.

Monitor for human disturbance of nesting bald eagles and take appropriate measures.

Trumpeter Swan Objectives

Rationales 116–118 and 120 are found in appendix H.

- Annually monitor trumpeter swan migration and nesting...*as in alternative A*
- Establish up to four breeding pairs of trumpeter swans on the refuge and surrounding suitable habitat, within 6 years of CCP approval, to restore trumpeter swans to unoccupied, historical breeding habitat and encourage broader winter distribution.
- To assist in the conservation and protection of trumpeter swans, within 3 years of CCP approval, develop an interpretive handout and provide one outreach program per year about living near swans and minimizing disturbance.

Strategies

Evaluate Dahl Lake's suitability to sustain a healthy, reproducing population of trumpeter swans; evaluate emergent vegetation and aquatic invertebrates in the lake.

Implement the habitat development plan to benefit trumpeter swans: (1) maintain or increase the current amount of emergent vegetation; (2) maintain water depths below 4 feet over extended areas; and (3) maintain stable water levels during the swan breeding season.

Annually compile sightings and habitat use data for trumpeter swans in Pleasant Valley area; coordinate through neighboring landowners, MFWP, PCTC, and the USDA Forest Service.

Provide lookouts during the swan migration and nesting season; seek assistance from Flathead Audubon volunteers.

Evaluate threats to swan-nesting success such as snapping turtles, lead shot, and power lines; reduce threats where possible.

Provide relatively disturbance-free swan-nesting areas.

Discourage sedentary swan flocks and prohibit supplementary feeding.

Introduce trumpeter swan cygnets and yearlings to area lakes and wetlands to reestablish nesting trumpeter swans in the Fisher River watershed; collaborate with the Trumpeter Swan Working Group and CSKT.

Limit public access in the trumpeter swan-nesting area, depending on nest site location.

Use signs to post trumpeter swan-nesting areas closed to public use; develop interpretive material to explain closures.

Monitor for trumpeter swans during routine duties including duck pair and brood counts.

Develop monitoring protocols for trumpeter swan restoration efforts.

Black Tern Objectives

Rationale 121 is found in appendix H.

- Annually monitor the number of nesting black terns, and monitor nesting and foraging habitat...*as in alternative A*

Strategies

Ensure refuge-specific data about black terns are included in statewide information; coordinate through MFWP.

Survey for presence, abundance, and nesting activity of black terns on Dahl Lake to determine the nesting population associated with current levels of emergent vegetation.

Monitor black tern nesting response to changes in water levels of Dahl Lake during implementation of the habitat development plan and other management activities.

Monitor for number of black tern adults present, number of nests, and nest success through the use of volunteers, interns, or refuge staff.

Determine the effects of wetland development on black tern habitat by doing pre- and postactivity measurements of vegetation response and water depth in emergent vegetation areas adjacent to open water; map acreages of emergent vegetation and open water in GIS.

Boreal Toad Objectives

Rationale 124 is found in appendix H.

- Assess the impacts that implementing the habitat development plan would have on the boreal toad population...*as in alternative A*

Strategies

Locate breeding sites for boreal toads (Hossack et al. 2001).

Cross reference boreal toad sites against the habitat development plan to determine needed changes.

Determine methods of wetland restoration and management that have the least adverse effect on boreal toads.

Determine what effects implementing the habitat management plan may have on the boreal toad, in collaboration with amphibian and reptile biologists.

Spalding's Catchfly Objectives

Rationale 125 is found in appendix H.

- Inventory for Spalding's catchfly prior to any management actions...*as in alternative A*
- Annually control invasive plants around any Spalding's catchfly population that has a minimum of 20 plants...*as in alternative A*
- Maintain known populations and plants of Spalding's catchfly and restore the catchfly in 75–90 percent of suitable sites, through evaluation of logistics and “best management practices, within 10 years of CCP approval, to protect and restore Spalding's catchfly.
- Conduct a complete search of suitable habitat to locate Spalding's catchfly and protect its habitat—eliminate grazing, control invasive plants, eliminate herbicide use in the area of the plants, and encourage natural fire regimes—within 5 years of CCP approval, to enhance production and survival of the catchfly.

Strategies

Mimic historic Palouse prairie fire regimes in habitat for Spalding's catchfly.

Inventory all suitable habitat within the legislative boundary of the refuge for the presence of Spalding's catchfly.

Locate and map sites of Spalding's catchfly using GPS technology.

Identify all Spalding's catchfly populations, plants, and habitat sites suitable for restoration; map in the GIS.

Search suitable habitat for Spalding's catchfly plants using volunteers from local schools and the Montana Native Plant Society, and Landmark Volunteers.

Establish a list of volunteers that are willing to help inventory for Spalding's catchfly or control invasive plants in catchfly habitat.

Notify the recovery team of newly located plants and populations of Spalding's catchfly; seek advice on management options.

Report locations of Spalding's catchfly populations to the Montana Natural Heritage Program.

Conduct site evaluations for habitat characteristics of Spalding's catchfly to better manage present and other potential sites of suitable habitat.

Evaluate short-term, long-term, and cumulative effects of management actions (e.g., invasive plant control and prescribed fire) on maintenance and restoration of Spalding's catchfly.

Protect Spalding's catchfly sites from trampling and grazing.

Evaluate the possibility of fencing areas where Spalding's catchfly is present.

Coordinate and collaborate with Montana DNRC to maintain Spalding's catchfly plants.

Maintain native Palouse prairie habitat in and around the Spalding's catchfly site with sufficient native forb composition to attract, but not compete for, pollinators.

Use volunteers from local schools or the Montana Native Plant Society to search suitable habitat for Spalding's catchfly plants.

Monitor all Spalding's catchfly populations on the refuge to determine population trend.

Monitor Spalding's catchfly from mid- to late July when flowers are in bloom using walk-through surveys.

Monitor Spalding's catchfly sites for insect damage and apply adaptive management to protect plants.

Map invasive plant populations within and around all Spalding's catchfly populations.

CULTURAL RESOURCES

Archaeological and historical resources, as well as traditional uses, are addressed in the management direction for cultural resources.

GOAL

Protect, manage, and interpret archaeological, cultural, and historical resources present at Lost Trail National Wildlife Refuge for the benefit of present and future generations.

Cultural Resources Objectives

The basis for the following objectives and strategies is described in rationales 126–129, found in appendix H.

- To preserve resources for all Americans and be in compliance with applicable laws and legislation, maintain and protect documented cultural and historical resources...*as in alternative A*
- Survey all refuge lands for cultural resources...*as in alternative A*
- Develop an outreach program...*as in alternative A*
- As a steward of cultural and historical resources to the Nation, research feasibility and restoration of at least one cultural and historical resource...*as in alternative B*

Strategies

Survey for cultural resources before doing developments and restoration activities.

Identify and nominate eligible properties to the National Register of Historic Places, working with appropriate agencies.

Use the most up-to-date techniques for surveying, documentation, preservation, restoration, and research through coordination with region 6's archaeologists, Montana State Historical Preservation Office, the CSKT THPO, and local scholars and experts.

Provide one full-time public use specialist to be trained to conduct and coordinate formal cultural surveys.

Provide one part-time historian to conduct formal surveys and oversee restoration of cultural sites.

Dispense outreach materials for cultural resources in partnership with local schools, colleges, and civic groups.

Develop partnerships with the Montana State Historic Preservation Office and CSKT THPO to provide expertise, personnel, and funding.

Accommodate access to and ceremonial use of sacred sites by religious practitioners of recognized Native American tribes in accordance with policy.

Develop a resource library of information about cultural sites on the refuge.

Develop programs for the public to experience cultural resources with limited direct contact, e.g.,

access to photographs and replicas vs. actual site visits.

Provide one full-time law enforcement officer to enforce laws and regulations to protect cultural resources.

Provide one full-time and one part-time maintenance staff to prevent damage and deterioration of resources.

Work with the Service's region 6 archaeologist to develop and perform a formal review of documented resources every 5 years to ensure protection, evaluation of condition, and preservation.

PUBLIC USE

Priority public uses (wildlife-dependent recreational uses) are addressed in the following management direction for public use.

GOAL

Provide quality wildlife-dependent recreational and educational opportunities for persons of all abilities to learn, understand, and enjoy the Intermountain ecosystem of northwestern Montana; its associated fish, wildlife, and plants of Lost Trail National Wildlife Refuge; and the National Wildlife Refuge System in a safe and compatible manner.

Public Use Objectives

Locations of public use and facilities are displayed in figure 14. The basis for the following objectives and strategies is described in rationales 131–132 and 138–139, found in appendix H.

General Objectives

- Develop a demographic profile of wildlife-dependent recreational users...*as in alternative A*
- Develop and implement a visitor service plan...*as in alternative A*
- To reduce disturbance and increase nest success probability, activities will not be permitted within 0.5-mile of any occupied golden eagle nest...*as in alternative A*
- Develop accessible facilities such as restrooms and drinkable water (figure 14), within 3 years of CCP approval, to provide quality, wildlife-dependent, public use opportunities.

Strategies

Collaborate with the Service's region 6 staff in EVS.

Provide one full-time public use specialist and one career-seasonal park ranger to work with the EVS staff to design, develop, and monitor the public use program.

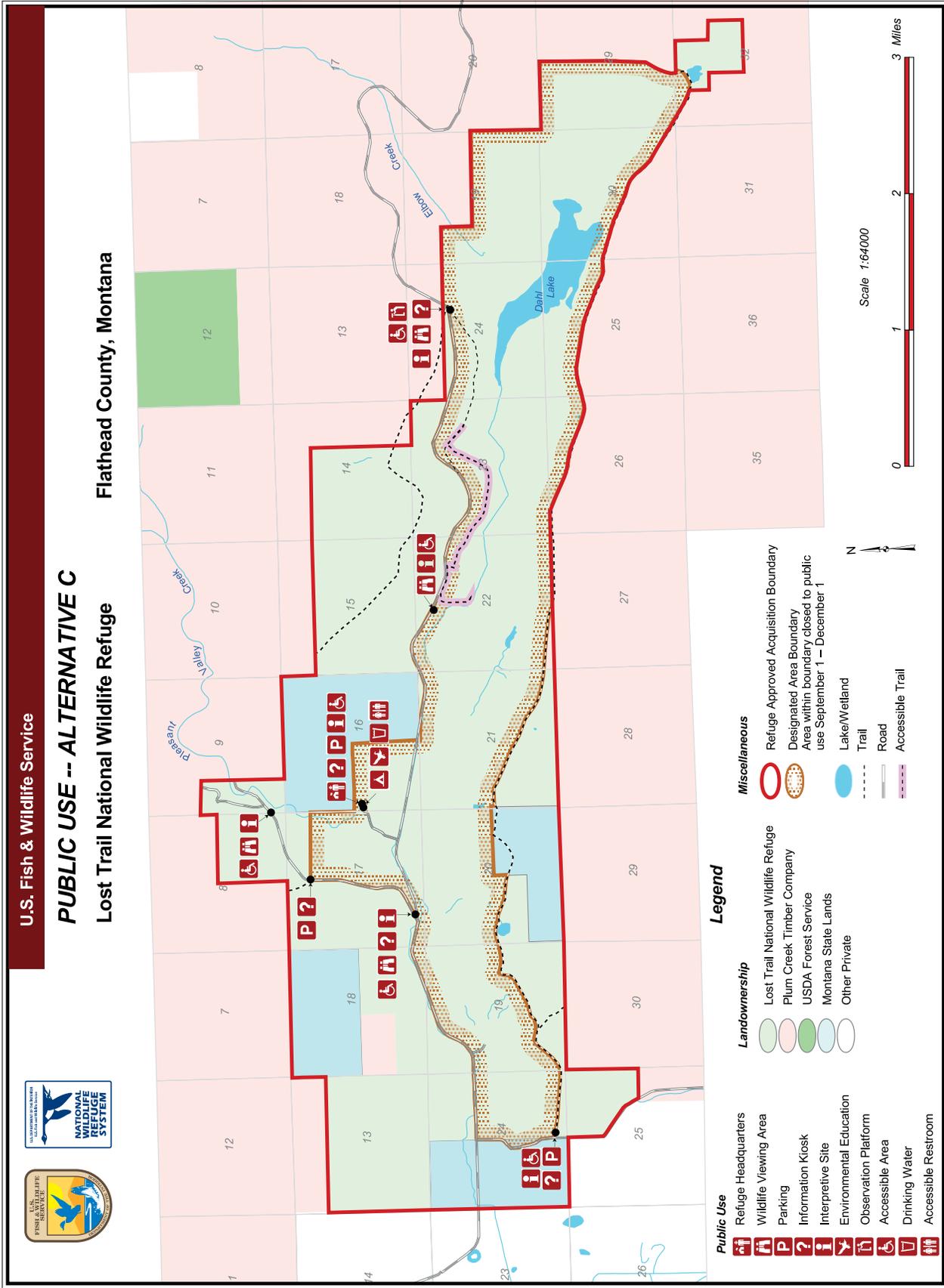


Figure 14. Public use under alternation C of the EA, Lost Trail National Wildlife Refuge, Montana

Provide one full-time public use specialist to work with EVS staff and the Office of Management and Budget to develop a demographic profile of current and future refuge visitors.

Evaluate proposed changes in public access prior to implementation; monitor for effects related to the grizzly bear if access is approved.

Limit public access in trumpeter swan-nesting areas, depending on nest site location.

Incorporate suspension provisions into special-use permits for the presence of grizzly bears.

Incorporate suspension provisions into special-use permits for the presence of wolves.

Allow existing levels of human activity if the bald eagle breeding area has at least 65 percent nest success, and has fledged at least five young during the preceding 5 years.

Limit disturbance to bald eagles by restricting construction of permanent developments such as kiosks, parking areas, and trails that may increase human activity within 0.5 mile of an occupied bald eagle nest or area with prime nesting potential.

Provide one full-time law enforcement officer to contact the public, educate about and enforce ethical standards, and enforce rules and regulations.

Provide one career-seasonal volunteer coordinator to establish and work with “friends groups.”

Provide for sales of educational and interpretive publications by developing a formal agreement with a cooperating natural history association.

Erect standard refuge entrance signs at entries along main roads.

Design and develop facilities to meet accessibility standards in coordination with region 6’s EVS staff.

Ensure that sites are accessible for all users; request design assistance from the National Center on Accessibility, the Summit Independent Living Center, and other groups.

Design and regulate permanent developments such as viewing areas, trails, parking lots, and kiosks to minimize disturbance and avoid conflict with key use areas of bald eagles.

Develop one either-sex accessible restroom facility to be available during daylight hours.

Provide a source of drinkable water available during daylight hours.

Erect and maintain at least three accessible kiosks with maps, rules and regulations, and wildlife-dependent recreational opportunities (figure 14).

Develop an accessible day use area with no fire pits.

Provide one full-time and one half-time maintenance staff to construct and maintain public use facilities and areas.

Help defray the cost of developing and maintaining sites through funding sources such as partnerships and grants.

Open the headquarters/contact station to the public a minimum of 5 days a week, including weekends during peak use (e.g., hunting season).

Provide one full-time public use specialist to recruit volunteers to staff the contact station to allow for minimum and increased operation.

Provide one half-time clerk to staff the contact station and dispense information.

Monitor and evaluate all public uses for their effects on large mammal numbers and distribution of wildlife, to manage for the gray wolf.

Conduct a formal visitor services requirement evaluation with region 6’s EVS staff to determine if the visitor service plan has been met and to determine future needs.

Obtain information on wildlife-dependent recreational users visiting the area, in coordination with MFWP, Flathead County Travel Board, Kalispell and Libby chambers of commerce, and the Institute for Tourism and Recreation Research (University of Montana).

Hunting Objectives

Rationales 141–144 are found in appendix H.

- Allow elk, deer, mountain grouse, and turkey hunting...*as in alternative A*
- Provide special youth-only hunts for deer and elk...*as in alternative A*
- Provide easily accessible information to, and personal contact with, hunters...*as in alternative A*

Strategies

Allow hunters access to portions of the refuge that would provide reasonable challenges and opportunities for taking targeted species under the described harvest objective and create minimal conflict with other priority wildlife-dependent recreational uses or refuge operations (appendix F).

Post and distribute refuge regulations prohibiting trapping to prevent accidental death of Canada lynx.

Make staff available at the contact station to provide rules, regulations, information, and first aid to hunters daily during the opening and closing weeks of archery and rifle seasons, and during weekends throughout hunting season. Staffing would be

recruited from the National Bison Range complex, as well as volunteers.

Provide one full-time law enforcement officer to be available in the field during hunting season to inform hunters of rules, regulations, and ethical behavior.

Provide adequate law enforcement staffing during peak hunting periods, in collaboration with MFWP.

Erect appropriate signs to designate closed and restricted areas to reduce the chance of noncompliance and conflicts with nonhunters.

Inform hunters with disabilities (who have obtained a MFWP permit to hunt from a vehicle) about opportunities to access designated refuge management roads and trails, in collaboration with MFWP.

Provide information about opportunities on surrounding lands to allow hunters to plan for a quality experience, in collaboration with PCTC, Flathead National Forest, and MFWP.

Designate the first week of archery season and the first week of rifle season as youth-only hunts for hunters 12–14 years of age, accompanied by an adult at least 21 years of age.

Make law enforcement and other staff available during the youth hunts to provide a positive hunting experience and promote ethical hunting behavior; include volunteers and MFWP personnel, as well as one full-time, refuge, law enforcement officer.

Develop and implement a monitoring system to receive input from hunters about their hunting experiences using direct interviews, registration stations at parking areas and trailheads, and mail-in/drop-off cards left on vehicles, working with region 6's EVS staff and the Office of Management and Budget.

Annually monitor and evaluate the presence of boundary hunting adjacent to closed areas of the refuge. If necessary to discourage this practice, consider these actions: (1) alter hunt area boundaries or habitat; and (2) eliminate parking areas and access roads—to distribute hunters or modify wildlife use patterns in ways that make boundary hunting less appealing.

Fishing Objectives

Rationales 145 and 147 are found in appendix H.

- Carry out evaluation and restoration of refuge wetlands and streams, with support and partners, within 1 year of CCP approval, to restore native fisheries and protect the Pleasant Valley ecosystem.
- Do not permit fishing for the duration of the CCP to protect natural resources.

- Provide one off-refuge fishing event for youth per year involving at least 20 participants, in coordination with partners, within 2 years of hiring a public use employee, to increase youth appreciation of fish and fishing.

Strategies

Clearly sign closed areas. Post interpretive messages about fishing closure at all contact points, kiosks, parking areas, and trailheads.

Provide one full-time public use specialist and one half-time park ranger to coordinate and conduct the fishing program. Pursue funding sources such as partnerships, grants, and fee programs.

Provide one full-time public use specialist to develop and provide information about fishing opportunities at nearby sites.

Collaborate with off-refuge youth fishing programs (such as MFWP, Hooked on Fishing, and Creston National Fish and Wildlife Center) and recruit community volunteers to help with events held at appropriate fishing sites off the refuge.

To attract more participants and provide more educational opportunities, conduct the youth fishing program during National Fishing Week (early June).

Work with youth programs such as Girl Scouts, Boy Scouts, and schools to encourage a broad spectrum of fishing event participation.

Wildlife Observation and Photography Objectives

Rationales 148–151 and 154–155 are found in appendix H.

- Develop observation and photography sites (four accessible wildlife-viewing areas, one accessible wildlife-viewing platform, and one accessible trail) within 5 years of CCP approval, to promote quality opportunities to the public.
- Encourage the highest standards of ethical behavior...*as in alternative A*
- Permit authorized public access on designated trails and roads to provide visitors with opportunities to observe and photograph wildlife in its natural habitat, and foster wildlife populations by limiting disturbance.
- Provide information about the best observation sites and successful photography techniques to 90 percent of visitors via the visitor contact station, interpretive materials, and interpretive kiosks to provide quality wildlife observation and photography opportunities.

Strategies

Instill ethical observation and photography behavior through presentations, workshops, and field trips, in collaboration with local outdoor groups such as the

Flathead Chapter of the Audubon Society, Boy Scouts, and Girl Scouts.

Provide one full-time biologist work to work with MFWP and NRCS to gather data on wildlife and plants for development of species lists.

Develop and distribute wildlife and bird lists.

Erect and maintain at least three accessible kiosks with maps, rules, and regulations. Post the best, current observational and photographic opportunities for wildlife (figure 14). Provide maintenance personnel to build and maintain kiosks.

Develop four accessible wildlife-viewing areas, one accessible observation platform, and one accessible trail (figure 14).

Provide one full-time and one half-time maintenance staff to construct and maintain parking areas, access points, observation blinds, observation platforms, and trails.

Develop partnerships with local wildlife groups such as Flathead Chapter of the Audubon Society and photography clubs to gather information on member use of local wildland areas for wildlife observation and photography.

Provide one full-time public use specialist and one career-seasonal park ranger to work with the Service's region 6 EVS staff to design, develop, and monitor the wildlife observation and photography program.

Prohibit public access in the area between the county road and the South Pleasant Valley Road from September 1 to December 15 (figure 14).

Allow authorized public access on the uplands from September 1 to December 15 (figure 14).

Allow authorized public access only on designated roads and trails from December 15 to September 1 (figure 14).

Develop a public use handout with a clear map, rules, and regulations; make handouts available at the contact station and kiosks.

Provide a public use specialist to work with the Service's region 6 EVS staff to develop interpretive handouts, including wildlife observational and photographic opportunities, successful techniques, a comprehensive map, rules, and regulations.

Monitor the wildlife observation and photography program with observation of visitor use, comment cards, car counters, registration at kiosks, and personal contacts.

Interpretation Objectives

Rationales 158–160 are found in appendix H.

- Develop interpretive materials...*as in alternative A*
- Develop interpretive themes...*as in alternative A*
- Ensure that at least 85 percent of visitors understand wetland values and the refuge's contribution to restoration and protection of Pleasant Valley wetlands, within 5 years of CCP approval, to promote public appreciation of natural resources.
- Ensure that at least 75 percent of visitors understand and comply with restrictions of public access to large portions of the backcountry, to increase support of management decisions to restore and protect refuge resources.

Strategies

Interpret the mission of the refuge, the National Wildlife Refuge System, and the Service through direct contact of staff with visitors.

Request design assistance from the National Center on Accessibility, the Summit Independent Living Center, and other groups to develop interpretive materials.

Distribute outreach materials about cultural resources in collaboration with local schools, colleges, and civic groups.

Erect and distribute interpretive signs and materials at parking areas, wildlife-viewing areas, trailheads, and the contact station.

Coordinate with local schools, Girl Scouts, Boy Scouts, MCC, and other youth groups to build interpretive nature trails while providing an educational experience for youth.

Develop interpretive materials about management of the refuge, the National Wildlife Refuge System, and the Service.

Develop interpretive materials about the history of Pleasant Valley, in collaboration with the CSKT, local history groups, and neighbors.

Provide one full-time public use specialist to develop cultural resource materials to dispense to the public.

Provide one full-time public use specialist to work with region 6's EVS Staff and NRCS to design and develop interpretive displays about wetlands to be erected at the Dahl Lake wildlife-viewing area, along interpretive trails, and at the contact station (figure 14).

Develop an interpretive handout for trumpeter swans; coordinate with the "Trumpeter Swan Working Group."

Use signs to post areas closed to the public during use by trumpeter swans; develop interpretive material to explain closures for swans.

Provide educational material about the effects of disturbance on waterfowl.

Educate the public on how to minimize winter disturbance and stress to large mammals during recreational activities.

Develop interpretive materials about endangered species, working with region 6's ecological services staff.

Develop an outreach program for the public on the grizzly bear and recovery efforts, to develop better support for and understanding of the species and to minimize adverse human actions and conflicts. Work with the interpretation and education subcommittee of the Interagency Grizzly Bear Committee.

Develop an outreach program to perpetuate understanding and support of wolves and their management on the refuge.

Develop interpretive material about Spalding's catchfly to educate the public on identification of the plant, habitat requirements, and why the plant is endangered.

Develop an interpretive display to post at the contact station, kiosks, parking areas, and trailheads to inform users of ethical behavior.

Provide one full-time public use specialist to develop and present outreach programs and interpretive materials about "light on the land" recreational behavior.

Produce and distribute a tear sheet with a map that designates areas open and closed to hunting, along with all pertinent rules, regulations, and restrictions so hunters can make informed decisions (appendix F).

Develop media contacts and outreach materials to inform the hunting community of hunting opportunities for youth.

Erect interpretive displays at designated parking areas (figure 14) and at the contact station that describe ways to hunt ethically and explain hunting rules, regulations, and restrictions.

Provide one full-time public use specialist to develop outreach information and interpretive programs about a native fish restoration program to educate the public and garner support.

Develop a public use brochure with a clear map, wildlife-dependent recreational opportunities, rules, and regulations; make brochure available at accessible points within 2 years (figure 14).

Develop and design an accessible contact station.

Design and develop interpretive displays for the contact station, working with the Service's region 6 EVS staff.

Provide one full-time maintenance staff to build and maintain the wildlife-viewing area and trails.

Develop interpretive materials about wetland restoration within 2 years, in partnership with NRCS.

Monitor the effectiveness of interpretive messages through comment cards, registration, and personal contacts.

Develop an interpretive handout with tips for ethical viewing behavior and the advantages of following them, i.e., less disturbance to wildlife provides more viewing opportunities.

Provide one half-time clerk to staff the contact station and dispense information.

Develop a formal agreement with a cooperating natural history association to provide for sales of educational and interpretive publications.

In partnership with local wildlife and outdoor groups such as Boy and Girl Scouts, Trout Unlimited, and Flathead Chapter of the Audubon Society, dispense information about low-impact wildlife-dependent recreational opportunities to members of these groups.

Environmental Education Objectives

Rationales 161–167 are found in appendix H.

- Develop an extensive environmental education program...*as in alternative A*
- Develop and maintain a lending library...*as in alternative A*
- Provide at least one in-class environmental education program per school each year, for schools within a 1-hour commute, to foster stewardship of the land, understanding of the refuge vision of conserving natural resources, and experiencing the wonder of native plants and animals, as well as cultural resources.
- Recruit students and educators to contribute to data-gathering and restoration activities, as measured by number of participants and number of returnees each year, to foster understanding of natural and cultural resources, and effectively achieve management and restoration goals.
- Develop an accessible campground for overnight use by educational groups within 2 years of implementation of an environmental education program, to allow students and educators to gain hands-on experience and appreciation of natural resources.

Strategies

Determine environmental educational needs and student numbers within a 2-hour travel radius through collaboration with local schools, including Flathead Valley Community College and the University of Montana's Yellow Bay Biological Station.

Develop an environmental education manual that fulfills both the educational requirements of local and nearby students and the vision and goals of the refuge. Work closely with Pleasant Valley and Marion school districts.

Develop refuge-based themes such as wetlands, endangered species, and local history and incorporate local, state, and national educational standards into programs, working with local schools.

Promote hunter education for youth by providing educational materials and outdoor education sites, in collaboration with MFWP.

Become a member of the Environmental Education Core Group, a coalition of local individuals and groups (private and governmental) involved in environmental education.

Provide one full-time public use specialist to develop, implement, and monitor the environmental education program.

Provide two career-seasonal park rangers to develop and present environmental education programs off-site.

Provide training to environmental education staff at least once a year to attain the knowledge, skills, and abilities to support environmental education at a minimum level.

Recruit and train volunteers to assist in developing and presenting environmental education programs.

Conduct at least one field trip or environmental education activity per year in collaboration with the Pleasant Valley and Marion schools to aid in students' biology education.

Conduct at least one hands-on project per year for biology student in collaboration with the Montana Academy to aid in students' biology education, as well as benefit refuge resources.

Pursue grants that would allow schools to participate in environmental education at the refuge, in coordination with the school boards of Pleasant Valley and Marion schools.

Recruit students for the program, in coordination with local public and private schools, including Montana Academy, Flathead Valley Community College, and the University of Montana's Yellow Bay Biological Station.

Work with MFWP, Glacier National Park, Flathead National Forest, and the CSKT to determine what they offer and whom they serve.

Design and develop an environmental education classroom and laboratory to be located at the contact station (figure 14), working with region 6's EVS staff and the National Center on Accessibility.

Research and obtain materials relevant to natural and cultural resources of the refuge and Pleasant Valley.

Develop and gather environmental education materials, working with region 6's EVS staff and the Service's NCTC, division of educational outreach.

Establish formal partnerships with school districts and community groups to assist with development, implementation, and promotion of the library.

Develop and maintain a web page with information on environmental education opportunities, lending library materials, Service links, and other resources.

Provide one full-time public use specialist to develop, organize, maintain, and distribute library materials.

Create a nonprofit group to support environmental education and research at the refuge, in coordination with the Montana State University extension office (Flathead County).

Develop partnerships with local schools, Girl Scouts, Boy Scouts, the MCC, and other youth groups to provide an educational experience through building observation blinds, trails, and wildlife-viewing areas; fence removal; and habitat management.

Seek assistance from the Montana Academy staff in areas that may be beneficial to the refuge as well as to students (e.g., tansy ragwort control).

Collaborate with colleges and universities to obtain student teachers and interns to supervise restoration programs, while exposing them to the role and importance of refuges and the relationship between wildlife and associated ecosystems.

Provide students to assist with natural resource programs of refuge partners, including NRCS and MFWP.

Provide one full-time public use specialist and one career-seasonal assistant to develop lesson plans that support restoration projects, including initial contact and follow-up to reinforce themes and messages.

Work with the Service's region 6 EVS staff to design the campground to meet accessibility standards.

Provide one full-time public use specialist to coordinate campground use with environmental

education activities, organize a reservation system for qualified groups, and monitor the site during use.

Develop a formal agreement with a cooperating natural history association to provide for sales of educational and interpretive publications.

Develop and provide a refuge-specific curriculum that incorporates, complements, and focuses on local school curricula; work with school district, educators, and the Service's region 6 EVS staff.

Provide one full-time biologist to define restoration projects and data-gathering needs for environmental education activities.

Develop and implement a monitoring system to determine the effectiveness of the environmental education program, including the students and educators involved as well as resources restored; work with the Service's region 6 EVS staff.

ADMINISTRATION

Organizational structure, staffing, facilities, equipment, and maintenance are administrative items addressed in the management direction.

GOAL

Provide staffing, funding, and facilities to maintain the long-term integrity of habitats and wildlife resources of Lost Trail National Wildlife Refuge in supporting the achievement of ecosystem and National Wildlife Refuge System goals.

Administration Objectives

The basis for the following objectives and strategies is described in rationales in appendix H.

Operations Objectives

Rationales 169–178 are found in appendix H.

- Form a new complex comprised of Lost Trail National Wildlife Refuge, Swan River National Wildlife Refuge, and the Northwest Montana WMD...*as in alternative A*
- Provide adequate resources and staff...*as in alternative A*
- Provide on-site law enforcement...*as in alternative A*
- Annually use volunteers...*as in alternative A*

Strategies

Provide a separate organizational code and appropriations, by the Service's region 6 office, for future operations, maintenance, and administration of the refuge.

Transfer the annual funding for the National Bison Range, for one full-time employee for the on-site

supervisory refuge operations specialist, to the reorganized refuge complex.

Recruit one supervisory refuge operations specialist (GS-12) to provide management operations, oversight, and administration for the refuge and other Service units north of the refuge.

Maintain the on-site, full-time refuge manager (GS-11, supervisory refuge operations specialist) to provide daily supervision and oversight to all activities and operations.

Recruit one maintenance worker (WG-8) to provide adequate resources to operate, maintain, and repair facilities.

Develop a web page to describe available maintenance resources and to monitor and track materials.

Recruit one full-time wildlife biologist (GS-11) to be stationed at the refuge for coordination of the biological program.

Hire one full-time administrative support assistant (GS-4/5) to provide daily on-site clerical and administrative support.

Coordinate and plan equipment needs with the maintenance supervisor and project leader at complex headquarters through the RONS and MMS processes, to acquire appropriate equipment to maintain facilities and habitats (e.g., tractor, mower, backhoe, pickup, dump truck, motor boat, vehicle hoist, equipment repair tools and diagnostics, and carpentry tools and machinery).

Maintain equipment in a safe and efficient operating status.

Replace and add equipment through the RONS planning process as needed (due to normal deterioration and needed repair, and as staffing is increased).

Provide microscopes and other necessary equipment to support the environmental education curriculum.

Provide field guides, binoculars, and spotting scopes to assist with census work.

Provide VCRs, televisions, and slide projectors to preview audiovisual materials.

Provide satellite capacity for the Service's "distance from learning" program.

Communicate with MFWP staff to maintain adequate levels of law enforcement on and adjacent to the refuge.

Provide one full-time law enforcement officer to protect natural and cultural resources by coordinating with MFWP.

Facilities Objectives

Rationales 186–188 and 191 are found in appendix H.

- Provide adequate administrative and maintenance facilities...*as in alternative A*
- Identify and remove unnecessary structures...*as in alternative A*
- Restore and protect 28 miles of graveled and two-tracked grass roads...*as in alternative B*

Strategies

Modify the horse arena to provide administrative space, a maintenance shop, and equipment storage; submit as a RONS project to modify the building and acquire equipment and tools including a phone system, computers, work stations, filing and storage cabinets, a vehicle lift, a vehicle wash bay, equipment repair tools, carpentry tools, and metal working tools.

Coordinate with Flathead Wildlife, Inc. to assist with building parking areas for designated public use activities and assist with habitat management projects.

Develop a recreational vehicle trailer site to support a volunteer program.

Work with the Service's region 6 staff (education and visitor services) on design and accessibility requirements.

Repair and maintain facilities, buildings, fences, and roads on an "as-needed basis."

Coordinate restoration and maintenance of PCTC easement roads according to terms of the existing cooperative road easement.

Coordinate with the PCTC where shared-easement road maintenance is applicable.

Remove unnecessary facilities and structures including interior fences, east cattle station structures, guest cottage building, ranch office building, and feedlot corrals.

Complete facility maintenance and fence removal through assistance from the MCC and Landmark Volunteers.

Continue the annual fence removal project (RMEF challenge cost-share grant initiated in 2000).

Recruit volunteers for projects such as removal of the east cattle station, clean up or removal of other facilities, monitoring, and public use activities.

PARTNERSHIPS

The management direction for partnerships addresses support to most refuge programs.

GOAL

Promote and develop partnerships with adjacent landowners, public and private organizations, and other interested individuals to preserve, restore, and enhance a diverse and productive ecosystem of which Lost Trail National Wildlife Refuge is an integral part.

Partnership Objectives

The basis for the following objectives and strategies is described in rationales 192–201 and 203, found in appendix H.

- In conjunction with PCTC; MFWP; Montana DNRC; USDA Forest Service; and private landowners, determine the opportunities and feasibility for a forest legacy easement...*as in alternative A*
- Partner with nongovernmental organizations...*as in alternative A*
- Develop a "friends group"...*as in alternative A*
- Share law enforcement responsibilities...*as in alternative A*
- Meet once a year with PCTC, RMEF, Flathead and Lincoln counties weed departments, and the USDA Forest Service to maintain partnerships...*as in alternative A*
- For the period of this CCP, collaborate with the Flathead County Road Department regarding refuge signage and potential cooperative road maintenance and possible relocation issues concerning Pleasant Valley Road...*as in alternative A*
- Continue issuing annual special-use permits with the USDA Forest Service for use, maintenance, and invasive plant control on refuge road North 1019...*as in alternative A*
- Continue coordination with Bonneville Power Administration regarding the power line easement...*as in alternative A*

Strategies

Collaborate with Partners for Fish and Wildlife to continue restoration on the refuge and adjacent lands.

Work with the Flathead County extension office to develop a "friends group" and a direction of focus.

Operate under the statewide agreement with the Montana DNRC for fire suppression on the refuge.

Coordinate fire suppression issues and protocols at annual meetings with Montana DNRC.

Continue coordination activities with PCTC regarding maintenance of existing fence lines.

Control beaver activities that impact Pleasant Valley Road, i.e., flooding, through coordination with MFWP.

Issue a special-use permit to the USDA Forest Service for use of road 1019 for the purpose of logging activities on land north of the refuge.

Continue to abide by rules and agreements in the existing power-line easement document. Annually review the easement document and coordinate all refuge activities that may affect the power line with Bonneville Power Administration.

Provide one three-quarters-time volunteer coordinator to implement the “friends program.”

Establish a “friends group” of people interested in the restoration and protection of native fish resources.

Coordinate closely with the NRCS on stream and wetland restoration throughout the WRP.

Collaborate with USGS, Northern Rocky Science Center, on management of wetlands.

Coordinate protection of species of concern with conservation easement partners such as the NRCS, WRP, MFWP, Montana Land Reliance, The Nature Conservancy, and Audubon Society.

Share the expense and workload of aerial pair and brood counts for waterfowl with MFWP; Avista Utilities; and the CSKT.

Coordinate work with the Montana DNRC, State Lands, PCTC, and USDA Forest Service for conservation of Neotropical migratory birds.

Coordinate with the MPIF and Montana Bird Conservation Partnership Initiative for Neotropical migratory birds.

Seek partners such as MFWP, PCTC, Defenders of Wildlife, Flathead and Kootenai National Forests, and the Great Bear Foundation, for grizzly bear conservation.

Work with state bald eagle biologists and MFWP.

Coordinate and collaborate with Montana DNRC to maintain Spalding’s catchfly.

Meet with “friends group” volunteers at least twice a year to determine group direction and assist where appropriate.

Use students to assist with fence removal or various other habitat management projects.

Maintain adequate levels of law enforcement assistance on or adjacent to the refuge during hunting seasons for big game and upland game birds through continued communication with MFWP.

Provide one full-time law enforcement officer to protect natural resources by coordinating with MFWP.

ALTERNATIVE D

NO-ACTION ALTERNATIVE

Habitats are protected from further detrimental change.

Minimum public use occurs.

Minimal staff conduct custodial-level maintenance.

Partnerships accomplish basic needs.

This alternative describes the level of management activity being conducted by the Service since acquiring the refuge in 1999. This alternative is driven by the philosophy of protecting habitat from further change, with rest from land use practices, while conducting fire suppression, baseline inventories, and monitoring. Minimal management occurs only after a need is established in response to a critical conservation issue. Public use is limited, with custodial-level maintenance.



Ray Washak/USFWS

Pleasant Valley

RIPARIAN HABITAT

Stream channels and associated vegetation are addressed in the management direction for riparian habitat. Water control structures that affect the functioning of riparian habitat, as well as fish passage, are addressed.

GOAL

Restore, enhance, and maintain a mixed deciduous and coniferous riparian habitat to support indigenous wildlife species and perpetuate the ecological integrity of the Fisher River watershed.

Riparian Habitat Objective

The basis for the following objective and strategies is described in rationales 1–2 and 7, found in appendix H.

- The Service will maintain coordination and collaboration for restoration of the stream vegetation and stream meander on the WRP easement... *as in alternative A*

Strategies

Study stream characteristics and the biological potential of Pleasant Valley Creek, in collaboration with NRCS; MFWP; and Trout Unlimited.

Determine viability of sport fish populations by evaluating species presence, potential for continued reproduction, population size capable of supporting expected fishing pressure, and recovery of absent species.

Conduct surveys for migratory birds, songbirds, amphibians, and vegetation before and after restoration efforts in refuge ponds and Pleasant Valley Creek, in collaboration with NRCS and volunteers.

WETLAND HABITAT

Lakes, bogs, and other saturated wetland areas are addressed in the management direction for wetland habitat.

GOAL

Provide breeding, resting, and feeding habitat for wetland-dependent species of northwestern Montana by restoring, maintaining, and enhancing a mosaic of lake, semipermanent, seasonal, temporary, and saturated wetlands.

Wetland Habitat Objectives

The basis for the following objectives and strategies is described in rationales 8–10, 12, and 17; found in appendix H.

- Maintain wetland basins other than the Dahl Lake complex... *as in alternative A*
- Restore Dahl Lake complex water levels... *as in alternative A*
- Increase ground-nesting habitat... *as in alternative A*
- Recharge one-third of drained wetlands to 75–100 percent capacity within 1 year of CCP approval, to foster wetland recharge, promote revegetation around wetlands, and provide waterfowl habitat.
- Annually monitor Dahl Lake vegetation response to initial increase in water and subsequent naturally occurring water level fluctuations to determine whether the refuge (figure 2, unit 14) gains an increase in native emergent vegetation [more than 105 acres of bulrush and sedge, and a decrease in reed canarygrass (less than 630 acres) as a vegetation coverage alliance].

Strategies

Restore or increase water-holding capabilities in wetlands on the WRP easement, e.g., plug ditches, in coordination with the NRCS.

Install a water control structure in the culvert near headquarters to allow water to fill the wetland to road height without washing out the road.

If runoff should not be adequate the first year for wetland refill of each restored basin, divert water for 1–5 years to initiate recharge of the basin.

Plug wetland drain ditches in the wetlands west of Dahl Lake within the west mitigative parcel.

Fill the drain ditch (Meadow Creek) coming out of the west end of Dahl Lake with off-site spoils that remain on-site, and by trucking in spoils to fill the ditch back west to the location of the old water control structure (figure 3).

Use rest, grazing, haying, and prescribed fire to maintain open water and remove decadent, residual, emergent vegetation with adaptive management.

Allow wetlands to recharge and discharge with naturally occurring seasonal fluctuations. Use no control structures to manipulate water depth.

Construct 0.5-acre nesting islands to be irregular in shape with 5:1 slopes, top-dressed with soil, and seeded with native grasses and legumes for ground-nesting habitat.

Monitor wetland-vegetation coverage response to recharge every third year; map in the GIS.

Annually monitor vegetative response by measuring habitat coverage; map in GIS.

Annually monitor emergent vegetation and reed canarygrass coverage in Dahl Lake with line transects for density; map in GIS.

Annually conduct pair-count surveys for water birds to monitor use of wetlands pre- and post-refill.

GRASSLAND HABITAT

This management direction is for the diverse grasslands covering the majority of the refuge.

GOAL

Restore, enhance, and maintain Intermountain grasslands, with an emphasis on native bunchgrass prairie to provide habitat for migratory birds, species of concern, and associated wildlife species.

Grassland Habitat Objectives

The basis for the following objectives and strategies is described in rationales 18–21 and 27–28, found in appendix H.

- Fence and post the entire refuge boundary... *as in alternative A*
- Develop soil descriptions... *as in alternative A*
- Restore vigor to grasslands within 5 years of CCP approval, with rest from use of any management tool until reaching a minimum of 0.6 inch litter depth and a minimum 7.9 inches VOR in areas of tame grasses [Idaho fescue has an average of 8–12 flower stalks/plant, 7.9–8.87 inches maximum leaf length/plant, 2.2–2.7 square inches live basal area (Mueggler 1970, 1975), and an average 5–9 inches leaf height (Pond 1960); and rough fescue has an average 9.8–11.8 inches leaf height (McLean and Wikeem 1985)], to increase cover for nesting migratory birds and provide forage for other wildlife.
- Examine the biological potential of climax vegetative communities for grasslands of the uplands and bottomlands, and develop a habitat management plan that gives high priority to migratory bird habitat, within 2 years of CCP approval, to enhance biological integrity.

Strategies

Fence and post the refuge boundary; use staff from the National Bison Range complex or contracted personnel.

Use wildlife-friendly fencing in areas of high wildlife use, where feasible.

Survey or find markers in areas of uncertainty for the refuge boundary.

Use existing soils layers to determine which soils have not been classified.

Develop vegetation and soil type coverage; map in the GIS.

Sample soils and describe associated climax vegetation for each unclassified type; perform through a request to the NRCS.

Gather technical guides for vegetative climax communities for each soil type; coordinate with NRCS.

Identify and set priorities for areas of particular vegetative communities and those species for which they are managed.

Restrict grazing, haying, mowing, and prescribed fire on grasslands until cover has been restored.

Implement adaptive management (grazing, haying, mowing, or prescribed fire) based on desired habitat conditions for nesting migratory birds.

Develop a monitoring plan to evaluate habitat condition every 2 years to determine trend of vigor recovery for areas of grassland management interest.

Describe an adaptive management process in a habitat management plan describing how rest, prescribed fire, grazing, or haying will be used to maintain each vegetative community and condition.

FOREST HABITAT

Coniferous and deciduous forests are addressed in the management direction for forest habitat.

GOAL

Enhance and maintain Douglas-fir, ponderosa pine, aspen, and cottonwood forested habitats within the context of the Fisher River watershed for migratory birds, species of concern, and other associated wildlife species.

Forest Habitat Objectives

The basis for the following objectives and strategies is described in rationales 29–30 and 35, found in appendix H.

- Identify forest coverage types... *as in alternative A*
- Manage forest habitat with a “hands-off” policy, with the exception of wildland fire suppression, until a refuge manager and biologist are on-site to develop a management plan within 3 years after full staffing, to protect refuge and neighboring property.

Strategies

Prohibit precommercial thinning or clear cutting in habitat for Canada lynx.

Develop a fire management plan for forests above 3,300 feet in elevation that mimics natural fire regimes for Canada lynx habitat.

Get a biologist on the priority hiring list, working with the region 6 regional office.

Classify forest vegetation into National Vegetation Classification Standards; map in geographic information system database.

INVASIVE PLANTS

Prevention and control of nonnative, invasive plants are addressed in the management direction for invasive plants.

GOAL

Native plant communities, composition, occurrence, and density exist without degradation by invasive plants.

Invasive Plant Objectives

The basis for the following objectives and strategies is described in rationales 36–38, found in appendix H.

- Develop and implement an invasive plant management plan...*as in alternative A*

- Annually eradicate and maintain 75–90 percent control of tansy ragwort...*as in alternative A*
- Annually conduct invasive plant control on 200–400 acres of upland grasslands...*as in alternative A*

Strategies

Evaluate invasive plant infestations and control efforts since refuge establishment.

Evaluate invasive plant infestations within Pleasant Valley for priority areas of control by each partner.

Determine appropriate, effective control methods, e.g., mowing, chemical, biocontrol, and prescribed fire; consult with experts.

Gather information about cumulative impacts of chemical, biocontrol, and prescribed fire effects on invasive plants and on native vegetation response; review literature.

Use the GIS to predict areas at greatest risk of new invasions and develop early detection and prevention measures.

Share GIS layers of invasive plant infestations with PCTC and the USDA Forest Service.

Use hand pulling, hand spraying, and ATVs for herbicide application in areas within 330 feet of Spalding’s catchfly populations.

Evaluate the target species selectiveness of any biocontrol species prior to release.

Treat new invasions of tansy ragwort in late July and early August by bagging flower heads and burning them, and spraying rosettes with chemicals such as Transline or Tordon.

Survey proposed spray areas for Spalding’s catchfly prior to herbicide application.

Use ground and aerial herbicides to inhibit and eradicate encroachment by invasive plants.

Coordinate invasive plant control in Pleasant Valley by meeting at least once per year to share information and discuss control strategies: (1) with PCTC for spotted knapweed; and (2) with PCTC and the USDA Forest Service for tansy ragwort.

Develop a strategy with partners for control of tansy ragwort and how to prevent it from becoming a dominant plant species within the Pleasant Valley.

Attain assistance with tansy ragwort control from the Tansy Trust Fund grant program, as well as from the Service’s challenge cost-share grants.

Attain herbicide and/or a technician to apply herbicide and assist with mapping by pursuing grant funding.

Attain assistance with invasive plants (applications and monitoring) by pursuing grant funding through the project advisory committee, e.g., RMEF grants, until the refuge can support its own needs for control.

Determine the extent of infestation of sulfur cinquefoil; create a baseline map.

Continue to discuss, with partners, alternatives for invasive plant control within the Pleasant Valley.

Conduct literature review for reed canarygrass control.

Monitor infestation rates and effectiveness of control efforts; annually map the extent of infestation of spotted knapweed and tansy ragwort in the GIS.

Identify locations of new infestations; map locations and collaborate with the state coordinator for mapping records for neighboring PCTC land.

Monitor vegetation of upland grasslands for vigor and plant species composition every 2 years.

MIGRATORY BIRDS

Management direction for migratory birds addresses waterfowl, other water birds, shorebirds, and Neotropical migratory birds.

GOAL

Preserve, restore, and enhance the ecological diversity and abundance of migratory birds of the Intermountain West forest, wetland complexes, riparian habitat, and bunchgrass prairie.

Migratory Bird Objectives

The basis for the following objectives and strategies is described in rationales in appendix H.

Water Bird Objectives

Rationales 42–43 and 51–53 are found in appendix H.

- Annually monitor goose populations...*as in alternative A*
- Annually monitor waterfowl and other water birds for species presence, population trends, use, and production to evaluate waterfowl production.
- Annually monitor and maintain goose-nesting structures to increase populations of cavity-nesting species.

Strategies

Hire a full-time biologist or biological technician to be stationed at the refuge.

Determine average brood size and hen success with pair-count data to estimate production; use data obtained from the WMD.

Conduct duck pair counts in mid- to late May on Dahl Lake and all ponds.

Other Migratory Birds Objectives

Rationales 54–55 and 58 are found in appendix H.

- Monitor Neotropical migratory birds...*as in alternative A*
- Annually monitor and maintain bluebird and wood duck nest boxes to increase populations of cavity-nesting species.

Strategies

Conduct Neotropical migratory bird surveys, and nest success monitoring in forest, shrubland, cottonwood, and aspen habitats.

Continue existing Neotropical migratory bird surveys along Pleasant Valley Creek and the refuge road system with staff or volunteers.

Conduct additional surveys and nest success monitoring for Neotropical migratory birds to examine more closely the effects of the Pleasant Valley Creek restoration project, working with NRCS, partners, and volunteers.

Note tern, grebe, and sandhill crane numbers on the duck pair counts and Neotropical migratory bird surveys.

Maintain and clean goose nesting structures and bluebird and wood duck boxes; monitor nesting.

OTHER WILDLIFE

Resident wildlife including large and small mammals, resident birds, amphibians, and reptiles are addressed in the management direction for other wildlife.

GOAL

Restore and maintain resident and endemic wildlife populations of northwestern Montana to maintain and enhance species diversity of Lost Trail National Wildlife Refuge and Pleasant Valley.

Other Wildlife Objectives

The basis for the following objectives and strategies is described in rationales in appendix H.

Large Mammal Objectives

Rationales 61–64 and 69 are found in appendix H.

- Modify or remove all nonessential fences...*as in alternative A*
- Develop a plan for chronic-wasting disease...*as in alternative A*
- Annually compile sightings of and areas of use by large mammals, along with survey data from

MFWP, to monitor large mammal populations in Pleasant Valley.

Strategies

Hire biological staff or use the biologist from the National Bison Range complex, along with volunteers, to conduct monitoring.

Construct temporary fences (electric or barbless wire) if needed.

Identify fence locations and determine their importance for refuge management; map using a GPS.

Remove all fences (interior only) or modify fences for wildlife-friendly movement. Remove either the top and bottom wire or two bottom wires so the bottom wire is at least 18 inches off the ground; remove stays to enhance movement or use lay-down wires.

Incorporate additional gates into fences where it is not feasible to modify them; keep gates open when livestock are not present in grazing units.

Evaluate the cause and extent of any marked decline in large mammal populations and ascertain ways to assist recovery of the population (e.g., limit hunting or other public uses, improve habitat), in collaboration with MFWP.

Should resource damage occur due to high deer and elk populations, decrease populations through a change in hunting regulations, in collaboration with MFWP.

Coordinate proposed prevention, surveillance, research, and control actions for chronic-wasting disease in cooperation with state wildlife and agriculture agencies.

Conduct outreach to surrounding communities and communication to refuge visitors regarding chronic-wasting disease and disease management.

Remain alert to potential threats from chronic-wasting disease or other diseases.

Coordinate with the MFWP to assess effects of public use (e.g., implementation of the hunt plan) on large mammal populations in the Pleasant Valley watershed.

Monitor populations on an area-wide basis and relate to refuge populations through use of MFWP surveys for mountain lion, black bear, moose, elk, white-tailed deer, and mule deer.

Gather background information on areas and seasons of use by large mammal populations; conduct informal surveys.

Conduct a passive surveillance program for clinical signs of chronic-wasting disease or other health problems (may lead to a targeted surveillance based

on results); conduct monthly, opportunistic observations of deer and elk.

Small Mammal Objectives

Rationale 70 is found in appendix H.

- Monitor Columbian ground squirrel habitat acreage...*as in alternative A*

Strategies

Determine ground squirrel activity centers; map by size of population and damage to vegetation in the GIS.

Determine an acceptable baseline level for habitat affected by ground squirrels and their population numbers, using initial data.

Maintain ground squirrel numbers within 20 percent of a baseline determined after initial monitoring and literature research.

Determine changes in acres affected by ground squirrels; monitor ground squirrel activity on a 3- to 5-year basis.

Resident Bird Objectives

Rationales 72 and 74–75 are found in appendix H.

- Annually inventory and monitor resident (nonmigratory) birds...*as in alternative A*

[Specific objectives have not been developed for upland game birds under this alternative. However, it is expected that habitat objectives will indirectly benefit upland game species.]

Strategies

Limit disturbance within at least 0.5-mile from any occupied golden eagle nest; consider temporary implementation of alternate routes of public use or management.

Monitor for the arrival and nesting of golden eagles.

Amphibian and Reptile Objectives

Rationales 78–80 are found in appendix H.

- Gather amphibian population data...*as in alternative A*

Strategies

Develop habitat guidelines for amphibians and reptiles; consult experts.

Learn survey techniques and design surveys; coordinate with the “Amphibian Research and Monitoring Initiative” team.

Gather amphibian population data on the refuge as part of the “Amphibian Research and Monitoring Initiative,” in partnership with USGS researchers.

Report amphibian data to the regional level, i.e., “Amphibian Research and Monitoring Initiative” team, to support ecosystem-level monitoring.

Include the use of equipment, housing, or vehicles for refuge in-kind support to the USGS for the “Amphibian Research and Monitoring Initiative.”

SPECIES OF CONCERN

This management direction addresses wildlife listed by state or federal agencies as threatened and endangered (or proposed or candidate for listing), sensitive, rare, or species of concern.

GOAL

Contribute to the conservation, enhancement, and recovery of endangered, threatened, and species of concern populations in Lost Trail National Wildlife Refuge and Fisher River watershed.

Species of Concern Objectives

The basis for the following objectives and strategies is described in rationales 83–84, found in appendix H.

General Objectives

- Document sightings and locations of rare or unusual plants and wildlife...*as in alternative A*

Strategies

Hire a biologist to be stationed at the refuge to coordinate and monitor the program.

Record sightings of rare species during routine staff and volunteer duties.

Survey for owls, rails, and rare species; and monitor bald eagle nests and black tern nesting colonies; request assistance from Audubon volunteers.

Grizzly Bear Objectives

Rationales 87–88 are found in appendix H.

- Prohibit livestock grazing if a grizzly bear is within 1 mile...*as in alternative A*
- To ensure compliance with the ESA and to support the mission of the Service, minimize conflicts with and disturbance to grizzly bears...*as in alternative A*

Strategies

Determine the effects that proposed management actions would have on grizzly bears; consult with biologists.

Close areas for grizzly bears using signs and other informational material; enforce closures through law enforcement patrols.

Limit administrative activity in areas of grizzly bear activity.

Prevent livestock–bear competition for spring forage by restricting livestock grazing if a grizzly bear is within 1 mile of the refuge.

Close designated areas to all public access (based on each particular situation) when one or more grizzly bears are within 1 mile of the refuge.

Prohibit hunting of ground squirrels unless it becomes biologically necessary to protect resources.

Prohibit black bear hunting.

Monitor the occurrence and location of grizzly bears in Pleasant Valley, in collaboration with private landowners, MFWP, Interagency Grizzly Bear Coordination Team, USDA Forest Service, and PCTC.

Gray Wolf Objectives

Rationales 93–94 are found in appendix H.

- Evaluate the effects of management decisions on gray wolves...*as in alternative A*
- Prohibit livestock grazing when a wolf pack is present in Pleasant Valley...*as in alternative A*

Strategies

Determine the effects that proposed management actions would have on gray wolves; consult with biologists.

Prohibit livestock grazing when a wolf pack, as defined by the wolf recovery team, is present in Pleasant Valley.

Close the refuge to public access within 1 mile of any active wolf den or rendezvous site from May 1 to July 1.

Close designated areas of the refuge to all public access from December 1 to April 15 if wolves are in the Pleasant Valley watershed.

Prohibit sport trapping.

Canada Lynx Objectives

Rationale 103 is found in appendix H.

- Evaluate proposed management actions in Canada lynx habitats...*as in alternative A*

Strategies

Prohibit sport trapping for the life of this CCP, to prevent accidental death of lynx.

Bald Eagle Objectives

Rationales 107–108 are found in appendix H.

- Annually monitor bald eagle nesting and protect habitat...*as in alternative A*

Strategies

Evaluate all management decisions for their effects bald eagles prior to implementation, until foraging habitat can be identified.

Prohibit sport trapping.

Monitor bald eagle nest success to ensure that breeding areas have at least 65 percent nest success, and at least five young fledged during the preceding 5 years.

Monitor occupied bald eagle nest sites to determine fledgling success, using staff or volunteers.

Conduct surveys in a noninvasive manner after the hatching of bald eagle young.

Trumpeter Swan Objectives

Rationales 116–117 are found in appendix H.

- Annually monitor trumpeter swan migration and nesting...*as in alternative A*

Strategies

Annually compile sightings and habitat use data for trumpeter swans in Pleasant Valley area; coordinate through neighboring landowners, MFWP, PCTC, and USDA Forest Service.

Provide lookouts during the swan migration and nesting season; seek assistance from Flathead Audubon volunteers.

Limit public access in the trumpeter swan-nesting area, depending on nest site location.

Use signs to post trumpeter swan-nesting areas closed to public use; develop interpretive material to explain closures.

Monitor for trumpeter swans during routine duties including duck pair and brood counts.

Black Tern Objectives

Rationale 121 is found in appendix H.

- Annually monitor the number of nesting black terns, and monitor nesting and foraging habitat...*as in alternative A*

Strategies

Ensure refuge-specific data about black terns are included in statewide information; coordinate through MFWP.

Monitor for number of black tern adults present, number of nests, and nest success using volunteers, interns, or refuge staff.

Boreal Toad Objectives

Rationale 124 is found in appendix H.

- Assess the impacts that implementing the habitat development plan would have on the boreal toad population...*as in alternative A*

Strategies

Locate breeding sites for boreal toads (Hossack et al. 2001).

Cross reference boreal toad sites against the habitat development plan to determine needed changes.

Determine methods of wetland restoration and management that have the least adverse effect on boreal toads.

Document the response of boreal toads to revegetation and restoration of Pleasant Valley Creek; continue collaborative project with USGS' Amphibian and Reptile Monitoring Initiative.

Determine what effects implementing the habitat development plan may have on the boreal toad, in collaboration with amphibian and reptile biologists.

Spalding's Catchfly Objectives

Rationale 125 is found in appendix H.

- Inventory for Spalding's catchfly prior to any management actions...*as in alternative A*
- Annually control invasive plants around any Spalding's catchfly population that has a minimum of 20 plants...*as in alternative A*

Strategies

Inventory all suitable habitat within the legislative boundary of the refuge for the presence of Spalding's catchfly.

Locate and map sites of Spalding's catchfly using GPS technology.

Establish a list of volunteers that are willing to help inventory for Spalding's catchfly or control invasive plants in catchfly habitat.

Evaluate short-term, long-term, and cumulative effects of management actions (e.g., invasive plant control and prescribed fire) on maintenance and restoration of Spalding's catchfly.

Monitor Spalding's catchfly from mid- to late July when flowers are in bloom using walk-through surveys.

Map invasive plant populations within and around all Spalding's catchfly populations.

CULTURAL RESOURCES

Archaeological and historical resources, as well as traditional uses, are addressed in the management direction for cultural resources.

GOAL

Protect, manage, and interpret archaeological, cultural, and historical resources present at Lost Trail National Wildlife Refuge for the benefit of present and future generations.

Cultural Resources Objectives

The basis for the following objectives and strategies is described in rationales 126–127, found in appendix H.

- To preserve resources for all Americans and be in compliance with applicable laws and legislation, maintain and protect documented cultural and historical resources...*as in alternative A*
- To preserve resources for all Americans and be in compliance with applicable laws and legislation, document, maintain, and protect any previously unknown cultural and historical resources discovered during normal refuge duties.

Strategies

Survey for cultural resources before doing developments and restoration activities.

Use the most up-to-date techniques for documentation, preservation, restoration, and research through coordination with region 6's archaeologists, Montana State Historical Preservation Office, and the CSKT THPO.

Provide basic training to National Bison Range complex staff to recognize and minimize damage to cultural resources that may be encountered during normal field duties.

Accommodate access to and ceremonial use of sacred sites by religious practitioners of recognized Native American tribes in accordance with policy.

Work with National Bison Range complex maintenance staff to prevent damage and deterioration of resources.

Work with region 6's archaeologist to develop and perform a formal review of documented resources every 5 years to ensure protection, evaluation of condition, and preservation.

PUBLIC USE

Priority public uses (wildlife-dependent recreational uses) are addressed in the following management direction for public use.

GOAL

Provide quality wildlife-dependent recreational and educational opportunities for persons of all abilities to learn, understand, and enjoy the Intermountain ecosystem of northwestern Montana; its associated fish, wildlife, and plants of Lost Trail National Wildlife Refuge; and the National Wildlife Refuge System in a safe and compatible manner.

Public Use Objectives

Locations of public use and facilities are displayed in figure 15. The basis for the following objectives and strategies is described in rationales 131 and 140, found in appendix H.

General Objectives

To reduce disturbance and increase nest success probability, activities will not be permitted within 0.5-mile of any occupied golden eagle nest...*as in alternative A*

- Develop and implement a visitor service plan within 2 years of CCP approval to provide the highest quality wildlife-dependent recreational opportunities.
- Adopt the public access guidelines outlined in the tear sheet in appendix F to provide visitors with compatible public use opportunities.
- Provide limited support facilities (drinking water and restrooms) at the visitor contact station within 1 year of CCP approval, to support authorized public use.

Strategies

Collaborate with the Service's region 6 staff in EVS.

Evaluate proposed changes in public access prior to implementation; monitor for effects related to the grizzly bear if access is approved.

Limit public access in trumpeter swan-nesting areas, depending on nest site location.

Incorporate suspension provisions into special-use permits for the presence of grizzly bears.

Incorporate suspension provisions into special-use permits for the presence of wolves.

Allow high-intensity activities during the nonnesting season for bald eagles.

Allow existing levels of human activity if the bald eagle breeding area has at least 65 percent nest success, and has fledged at least five young during the preceding 5 years.

Limit disturbance to bald eagles by restricting construction of permanent developments such as kiosks, parking areas, and trails that may increase human activity within 0.5 mile of an occupied bald eagle nest or area with prime nesting potential.

Erect standard refuge entrance signs at entries along main roads.

Design and develop facilities to meet accessibility standards in coordination with the Service's region 6 EVS staff.

Design and develop accessible restroom facilities and provide drinkable water at the headquarters/contact station.

Erect and maintain at least three accessible kiosks with maps, rules and regulations, and wildlife-dependent recreational opportunities (figure 15).

Develop and maintain at least two parking areas with kiosks to dispense handouts and post information (figure 15); coordinate with maintenance staff from the National Bison Range complex.

Open the headquarters/contact station at least 20 hours per week to disseminate information on wildlife-dependent recreational uses of the refuge.

Work with the National Bison Range complex to recruit volunteers to staff the contact station, which would relieve refuge staff to work on other duties.

Make information about local camping areas and other services available at the contact station.

Provide opportunities for comments on public access, and revise policy if needed.

Conduct a formal visitor services requirement evaluation with region 6's EVS staff to determine if the visitor service plan has been met and to determine future needs.

Hunting Objectives

Rationales 141–144 are found in appendix H.

- Allow elk, deer, mountain grouse, and turkey hunting...*as in alternative A*
- Provide special youth-only hunts for deer and elk...*as in alternative A*
- Provide easily accessible information to, and personal contact with, hunters...*as in alternative A*

Strategies

Allow hunters access to portions of the refuge that would provide reasonable challenges and opportunities for taking targeted species under the described harvest objective and create minimal conflict with other priority wildlife-dependent recreational uses or refuge operations (appendix F).

Post and distribute refuge regulations prohibiting trapping to prevent accidental death of Canada lynx.

Make staff available at the contact station to provide rules, regulations, information, and first aid to hunters daily during the opening and closing weeks

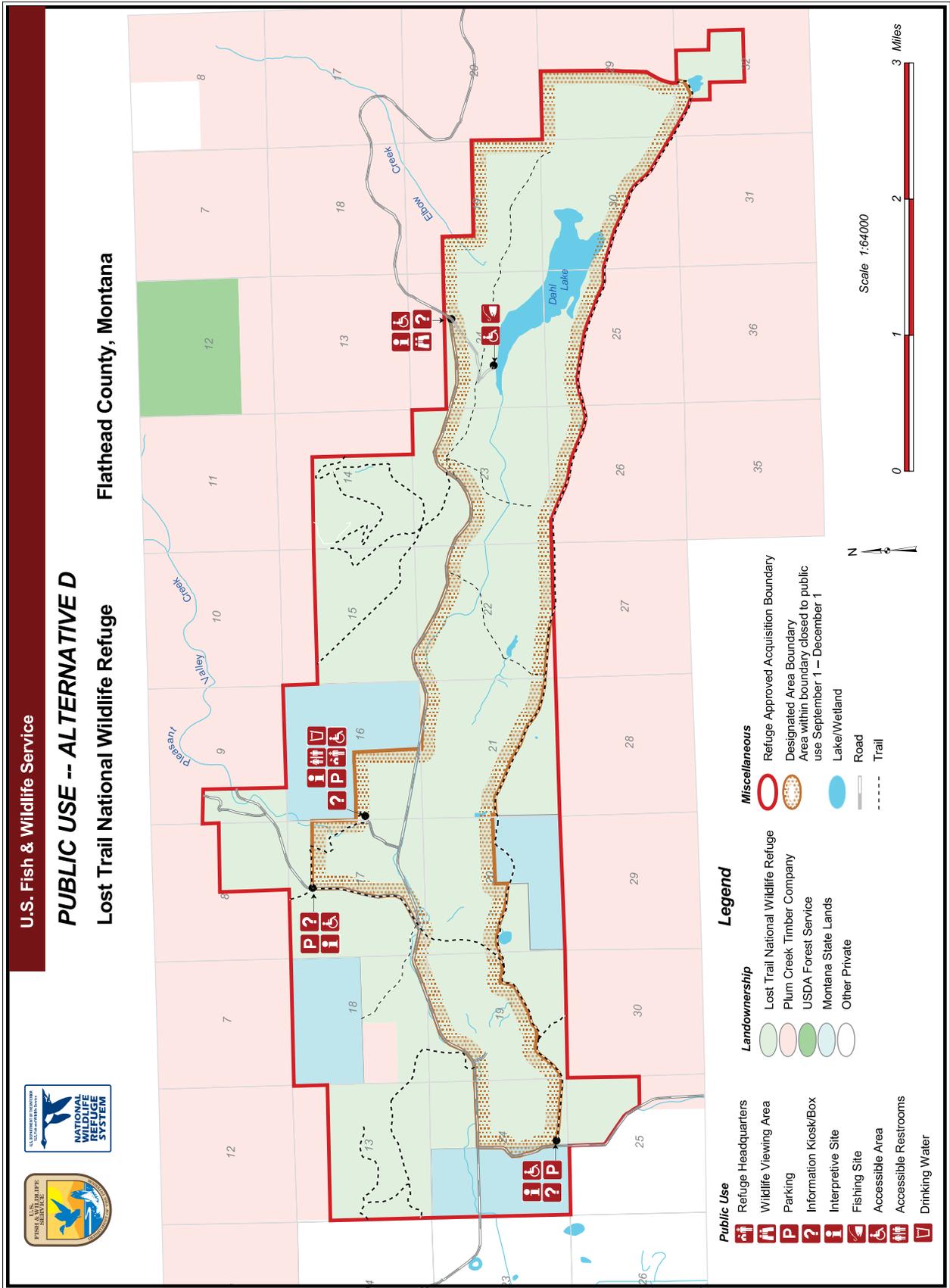


Figure 15. Public use under alternative D of the EA, Lost Trail National Wildlife Refuge, Montana

of archery and rifle seasons, and during weekends throughout hunting season. Staffing from the National Bison Range complex, as well as volunteers, would be recruited.

Provide one full-time law enforcement officer to be available in the field during hunting season to inform hunters of rules, regulations, and ethical behavior.

Provide adequate law enforcement staffing during peak hunting periods, in collaboration with MFWP.

Erect appropriate signs to designate closed and restricted areas to reduce the chance of noncompliance and conflicts with nonhunters.

Inform hunters with disabilities (who have obtained a MFWP permit to hunt from a vehicle) about opportunities to access designated refuge management roads and trails, in collaboration with MFWP.

Provide information about opportunities on surrounding lands to allow hunters to plan for a quality experience, in collaboration with PCTC, Flathead National Forest, and MFWP.

Designate the first week of archery season and the first week of rifle season as youth-only hunts for hunters 12–14 years of age, accompanied by an adult at least 21 years of age.

Make law enforcement and other staff available during the youth hunts to provide a positive hunting experience and promote ethical hunting behavior; include volunteers and MFWP personnel, as well as one full-time, refuge, law enforcement officer.

Develop and implement a monitoring system to receive input from hunters about their hunting experiences using direct interviews, registration stations at parking areas and trailheads, and mail-in/drop-off cards left on vehicles, working with region 6's EVS staff and the Office of Management and Budget.

Annually monitor and evaluate the presence of boundary hunting adjacent to closed areas of the refuge. If necessary to discourage this practice, consider these actions: (1) alter hunt area boundaries or habitat; and (2) eliminate parking areas and access roads—to distribute hunters or modify wildlife use patterns in ways that make boundary hunting less appealing.

Fishing Objectives

Rationale 146 is found in appendix H.

- Evaluate the existence of viable sport fish populations in Dahl Lake and Pleasant Valley and Meadow creeks every 5 years and, within 2 years of reaching a viable sport fishery population, develop a fishing plan that outlines steps to

provide a quality fishing program, to increase public use opportunities.

- Provide a quality fishing experience to persons of all abilities, if fish population levels are viable, with at least 90 percent of anglers reporting quality fishing experiences within 5 years of the fishing plan approval, to increase public use opportunities.

Strategies

Develop fishing access sites with parking areas to discourage the development of numerous unplanned roads and trails (figure 15).

Develop at least one accessible fishing access site (figure 15).

Provide law enforcement coverage to protect fledgling fishing resources, in collaboration with MFWP.

Develop a system to monitor the quality of fishing experiences using comment cards, personal contacts, and registration at fishing sites.

Develop and implement a fish monitoring plan, in coordination with biologists from the National Bison Range complex and MFWP.

Obtain data from conducted studies on fish populations, in coordination with MFWP, NRCS, and Montana DNRC.

Develop partnerships with MFWP, Montana DNRC, and Natural Resources Defense Council to obtain data from studies on fish populations.

Wildlife Observation and Photography Objectives

Rationales 148–149 and 156–157 are found in appendix H.

- Provide information about wildlife observation and photography opportunities to 90 percent of visitors via the refuge office, parking lot kiosks, and public use tear sheets, within 2 years of CCP approval, to provide all visitors with opportunities to observe and photograph wildlife.

Strategies

Develop and maintain at least two parking areas with kiosks to dispense handouts and post information; work with Bison Range complex maintenance personnel.

Erect and maintain at least three accessible kiosks with maps, rules, regulations, and wildlife-dependent recreational opportunities (figure 15).

Design contact station facilities to meet accessibility standards; National Bison Range staff work with the Service's region 6 EVS staff.

Develop handouts and maps showing the best areas for wildlife observation and photography, working with National Bison Range staff and the Service's region 6 EVS staff.

Interpretation Objectives

Rationales 158–159 are found in appendix H.

- Develop interpretive materials...*as in alternative A*

Strategies

Interpret the mission of the refuge, the National Wildlife Refuge System, and the Service through direct contact of staff with visitors.

Install appropriate interpretive panels at the contact station and kiosks (figure 15), in coordination with the outdoor recreation planner from the National Bison Range complex and region 6's EVS staff.

Develop handouts (tear sheets) with rules, regulations, maps and other information to protect resources and provide information about recreational opportunities, in coordination with the outdoor recreation planner from the National Bison Range complex and region 6 staff from EVS.

Pursue funding opportunities to print tear sheets with quality color maps.

Use signs to post areas closed to the public during use by trumpeter swans; develop interpretive material to explain closures for swans.

Produce and distribute a tear sheet with a map that designates areas open and closed to hunting, along with all pertinent rules, regulations, and restrictions so hunters can make informed decisions (appendix F).

Develop media contacts and outreach materials to inform the hunting community of hunting opportunities for youth.

Erect interpretive displays at designated parking areas (figure 15) and at the contact station that describe ways to hunt ethically and explain hunting rules, regulations, and restrictions.

If fish populations are found to be at a viable fishing level, develop a fishing handout with a map, access points, rules, and regulations.

Work with region 6's EVS staff to reserve and obtain traveling interpretive displays available for loan.

Environmental Education Objectives

Rationales 161–164 and 168 are found in appendix H.

- Develop and maintain a lending library...*as in alternative A*
- Encourage students and educators within the Pleasant Valley, Lost Prairie, and Marion areas to

visit the refuge once a year to foster stewardship of the land, understanding of the refuge vision of conserving natural resources, and experiencing the wonder of natural and cultural resources.

Strategies

Develop an environmental education manual that fulfills both the educational requirements of local and nearby students and the vision and goals of the refuge. Work closely with Pleasant Valley School District.

Develop refuge-specific curriculum, lesson plans, and activity guides that complement school curricula and use the refuge as a living laboratory, in collaboration with local schools and region 6's EVS staff.

Promote hunter education for youth by providing educational materials and outdoor education sites, in collaboration with MFWP.

Continue annual coordination with the outdoor recreation planner from the National Bison Range complex involving limited environmental education and interpretation programs with local schools and interest groups.

Recruit and train volunteers to assist in developing and presenting environmental education programs.

Accommodate the Pleasant Valley School whenever appropriate and compatible, to enhance their scientific and biological learning experiences.

Pursue grants that would allow schools to participate in environmental education at the refuge, in coordination with the Pleasant Valley School Board.

Provide one in-school program for each class to orient students prior to field trips to convey safety messages and describe appropriate field conduct to minimize resource damage.

Research and obtain materials relevant to natural and cultural resources of the refuge and Pleasant Valley.

Develop, organize, maintain, distribute, and track library materials, working with the outdoor recreation planner from the National Bison Range complex, region 6's EVS staff, and National Conservation Training Center (NCTC) division of educational outreach.

Promote the availability of materials to local schools and educational facilities, including Pleasant Valley School, Marion School, and the Montana Academy.

Conduct at least one hands-on project per year for biology student in collaboration with the Montana Academy to aid in students' biology education, as well as benefit refuge resources.

Develop partnerships with local schools, Girl Scout, Boy Scouts, the MCC, and other youth groups to provide an educational experience through participation in fence removal, facility maintenance, and other habitat management projects.

Seek assistance from the Montana Academy staff in areas that may be beneficial to the refuge as well as to students (e.g., tansy ragwort control).

Monitor the success of the library by tracking the number of teachers and schools requesting materials, and by providing feedback forms with all materials borrowed.

ADMINISTRATION

Organizational structure, staffing, facilities, equipment, and maintenance are administrative items addressed in the management direction.

GOAL

Provide staffing, funding, and facilities to maintain the long-term integrity of habitats and wildlife resources of Lost Trail National Wildlife Refuge in supporting the achievement of ecosystem and National Wildlife Refuge System goals.

Administration Objectives

The basis for the following objectives and strategies is described in rationales in appendix H.

Operations Objectives

Rationales 169–170 and 181–185 are found in appendix H.

- Annually use volunteers...*as in alternative A*
- Continue coordination with the lead biologist for the National Bison Range complex regarding biological program needs and opportunities for the period of this CCP.
- Maintain current equipment in a safe and efficient working condition to administer the refuge safely and efficiently.
- Provide law enforcement during hunting seasons and high visitor use periods, and coordinate with MFWP to enforce state hunting laws for the duration of this CCP, to provide natural resource protection and public safety.

Strategies

Maintain the on-site, full-time refuge manager (GS-11, supervisory refuge operations specialist) to provide daily supervision and oversight to all activities and operations.

List the maintenance worker as highest priority employment need.

Continue daily coordination with the clerical staff from the National Bison Range complex for

administration processing such as time, budget, and hiring.

Request maintenance assistance through the National Bison Range complex's maintenance supervisor, with at least two weeks notice.

Coordinate equipment repairs, maintenance, and replacement needs with the maintenance supervisor and project leader at the National Bison Range complex headquarters.

Develop a web page to describe available maintenance resources and to monitor and track materials.

Continue temporary duty of biological staff from the National Bison Range complex.

Continue National Bison Range complex funding for one part-time biological technician or park ranger during April–November.

Maintain equipment in a safe and efficient operating status.

Replace and add equipment through the RONS planning process as needed (due to normal deterioration and needed repair).

Provide microscopes and other necessary equipment to support the environmental education curriculum.

Provide field guides, binoculars, and spotting scopes to assist with census work.

Provide VCRs, televisions, and slide projectors to preview audiovisual materials.

Provide satellite capacity for the Service's "distance from learning" program.

Receive temporary-duty law enforcement assistance from the National Bison Range complex, as needed.

Meet with MFWP officials to coordinate law enforcement activities (refuge manager, assisted by law enforcement staff from the National Bison Range complex).

Communicate with MFWP staff to maintain adequate levels of law enforcement on and adjacent to the refuge.

Facilities Objectives

Rationale 186 is found in appendix H.

- Repair and maintain existing facilities, buildings, fences, and roads on an "as-needed basis" for the duration of this CCP, to provide basic support for refuge staff, and provide for public safety.

Strategies

Develop a recreational vehicle trailer site to support a volunteer program.

Coordinate with Flathead Wildlife, Inc. to assist with building parking areas for designated public use activities and assist with habitat management projects.

Work with the Service's region 6 EVS staff on design and accessibility requirements.

Repair and maintain facilities, buildings, fences, and roads on an "as-needed basis."

Implement RONS and MMS projects to maintain refuge resources.

Coordinate road maintenance with the Flathead County Road Department.

Coordinate with the PCTC where shared-easement road maintenance is applicable.

Remove unnecessary facilities and structures including interior fences, east cattle station structures, guest cottage building, ranch office building, and feedlot corrals.

Complete facility maintenance and fence removal through assistance from the MCC and Landmark Volunteers.

Continue the annual fence removal project (RMEF challenge cost-share grant initiated in 2000).

Recruit volunteers for projects such as removal of the east cattle station, clean up or removal of other facilities, monitoring, and public use activities.

PARTNERSHIPS

The management direction for partnerships addresses support to most refuge programs.

GOAL

Promote and develop partnerships with adjacent landowners, public and private organizations, and other interested individuals to preserve, restore, and enhance a diverse and productive ecosystem of which Lost Trail National Wildlife Refuge is an integral part.

Partnership Objectives

The basis for the following objectives and strategies is described in rationales 192–198 and 204, found in appendix H.

- Partner with nongovernmental organizations...*as in alternative A*
- Share law enforcement responsibilities...*as in alternative A*
- Meet once a year with PCTC, RMEF, Flathead and Lincoln counties weed departments, and the USDA Forest Service to maintain partnerships...*as in alternative A*

- For the period of this CCP, collaborate with the Flathead County Road Department regarding refuge signage and potential cooperative road maintenance and possible relocation issues concerning Pleasant Valley Road...*as in alternative A*
- Continue issuing annual special-use permits with the USDA Forest Service for use, maintenance, and invasive plant control on refuge road North 1019...*as in alternative A*
- Continue coordination with Bonneville Power Administration regarding the power line easement...*as in alternative A*

Strategies

Collaborate with Partners for Fish and Wildlife to continue restoration on the refuge and adjacent lands.

Operate under the statewide agreement with the Montana DNRC for fire suppression on the refuge.

Coordinate fire suppression issues and protocols at annual meetings with Montana DNRC.

Coordinate closely with the NRCS on stream and wetland restoration throughout the WRP.

Share the expense and workload of aerial pair and brood counts for waterfowl with MFWP; Avista Utilities; and the CSKT.

Collaborate with the Pleasant Valley School for a minimum of one field trip or environmental education activity per year to foster stewardship of the land, understanding of the refuge vision of conserving natural resources, and experiencing the wonder of natural and cultural resources.

Use students to assist with fence removal or various other habitat management projects.

FUNDING AND STAFFING

Funding levels for the above-described operations and staffing to achieve the refuge vision and goals are described for each alternative in tables 14 and 15.

Actions, projects, and maintenance needs for the refuge are displayed in tables derived from the RONS and MMS, in appendices I and J respectively.

Table 14. Staffing to carry out objectives and strategies of the CCP, Lost Trail National Wildlife Refuge, Montana

<i>Staffing</i>	<i>Alternative A (proposed action) —Biological potential emphasis —Compatible public use opportunities</i>	<i>Alternative B —Habitat and species protection —Maximum compatible, public use opportunities</i>	<i>Alternative C —Habitat restoration and natural processes —Minimum public use opportunities</i>	<i>Alternative D (no action) —Custodial management —Limited public use opportunities</i>
Supervisory refuge operations specialist* ¹				✓
Supervisory refuge operations specialist ²	✓	✓	✓	
Wildlife biologist ¹	✓	✓	✓	
Biological technician ³	✓	✓	✓	
Outdoor recreation planner (public use specialist) ¹	✓	✓	✓	
Park ranger ³	✓	✓	✓	
Administrative support assistant ⁴	✓	✓	✓	
Maintenance worker ⁵	✓	✓	✓	
Biological technician/park ranger, summer ⁶		✓	✓ (2 positions)	✓
Volunteer for biological program				✓
Historian (part-time) ⁷		✓		
Volunteer program coordinator (part-time) ⁶		✓		
Annual Salary Total⁸	\$390,000	\$436,000	\$399,000	\$98,000

*Existing position

¹GS-11 \$47,110/year plus benefits

²GS-12 \$56,463/year plus benefits

³GS-9 \$38,936/year plus benefits

⁴GS-5 \$25,697/year plus benefits

⁵WG-8 \$35,782/year plus benefits

⁶GS-4/5 \$25,696/year plus benefits

⁷GS-7/9 \$38,936/year plus benefits

⁸Based on general schedule (GS) position levels and salary, rounded to nearest thousand

Table 15. Budgetary needs to carry out objectives and strategies of the CCP, Lost Trail National Wildlife Refuge, Montana

<i>Budgetary Needs</i>	<i>Alternative A</i>	<i>Alternative B</i>	<i>Alternative C</i>	<i>Alternative D</i>
Administration and maintenance facility	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000
Equipment	200,000	200,000	200,000	200,000
Environmental education program	200,000	250,000	200,000	25,000
“Friends group” facility and activities	250,000	300,000	250,000	0
Lending library	300,000	300,000	300,000	50,000
Operations (annual supplies, gas, etc.):	56,000	56,000	56,000	56,000
Salary with benefits	390,000	436,000	399,000	98,000
Structure maintenance and improvement	500,000	550,000	500,000	500,000
Vehicles	250,000	250,000	280,000	250,000
Visitor contact station	350,000	375,000	350,000	30,000
Museum	0	400,000	0	0
Total	\$3,996,000	\$4,217,000	\$4,035,000	\$2,709,000

5 Environmental Consequences

The environmental consequences, or impacts, displayed here are the potential effects on a resource as a result of carrying out the actions of an alternative.

For a better understanding of why these effects may occur, refer to the descriptions of resource conditions and interactions in chapter 3 (affected environment). Even more detail for some resources may be found in appendix A.

Chapter 4 (alternatives) presents the management scenario—objectives and strategies—for each alternative, which could create the consequences described here.

This chapter presents the following:

- summary of environmental consequences (table 16)
- environmental justice
- consequences common to all alternatives
- range of environmental consequences



Sunset at the refuge.

Ray Washtak/USFWS

Table 16. Summary matrix of environmental consequences for the draft CCP and EA, Lost Trail National Wildlife Refuge, Montana

	<i>Alternative A</i> (proposed action) –Biological potential emphasis –Compatible public use opportunities	<i>Alternative B</i> –Habitat and species protection –Maximum compatible, public use opportunities	<i>Alternative C</i> –Habitat restoration and natural processes –Minimum public use opportunities	<i>Alternative D</i> (no action) –Custodial management –Limited public use opportunities
<i>HABITAT MANAGEMENT ISSUES</i>	<i>Soils</i> Negligible effects on soil conditions.	<i>same as alternative A</i> →		
Loss of water downstream due to restoration projects	<i>Air Quality</i> Minimal temporary impact ameliorated by conservation easements.	<i>same as alternative A</i> →		
Eradication of invasive plants	Road use and maintenance may temporarily lessen air quality.	<i>same as alternative A</i> →		
Loss of grazing opportunities	<i>Hydrology</i> Wetland and riparian habitats would benefit as well as local and migratory wildlife. Increased public use would require additional water allocations. Use and maintenance of public roads could increase siltation of streams and wetlands.			

Table 16. Summary matrix of environmental consequences for the draft CCP and EA, Lost Trail National Wildlife Refuge, Montana

	<i>Alternative A</i> (proposed action) –Biological potential emphasis –Compatible public use opportunities	<i>Alternative B</i> –Habitat and species protection –Maximum compatible, public use opportunities	<i>Alternative C</i> –Habitat restoration and natural processes –Minimum public use opportunities	<i>Alternative D</i> (no action) –Custodial management –Limited public use opportunities
HABITAT MANAGEMENT ISSUES	Riparian Habitat Goal	Restore, enhance, and maintain a mixed deciduous and coniferous riparian habitat to support indigenous wildlife species and perpetuate the ecological integrity of the Fisher River watershed..		
Loss of water downstream due to restoration projects Eradication of invasive plants Loss of grazing opportunities	Riparian corridor function benefits with protection from browsing, invasive plant control, prescribed fire, riparian vegetation plantings, and natural streamflow reestablishment. Fisheries and fishing would be positively impacted as well as water quality.	<i>same as alternative A except</i> some benefits would be ameliorated by increased foot traffic and other public use impacts.		<i>except</i> restoration would be accomplished at a slower pace and with the help of volunteers.
	Wetland Habitat Goal	Provide breeding, resting, and feeding habitat for wetland-dependent species of northwestern Montana by restoring, maintaining, and enhancing a mosaic of lake, semipermanent, seasonal, temporary, and saturated wetlands.		
	Wetland basins would be expanded and reinvigorated through water management. A mosaic of wetland types benefit a wide variety of native and migratory plants and animals throughout their life cycles. Increased size of wetland basins could have adverse effects on undocumented and unprotected cultural resources.	<i>same as alternative A except</i> some benefits ameliorated from increased public use.		<i>except</i> wetland restoration is not as extensive and benefits to wildlife take longer to be realized.
	Grassland Habitat Goal	Restore, enhance, and maintain intermountain grasslands, with an emphasis on native bunchgrass prairie to provide habitat for migratory birds, species of concern, and associated wildlife species.		
	Grasslands and their associated wildlife benefit and indigenous species would be reestablished through invasive plant control, prescribed fire, grazing regime modifications, and tree thinning.	<i>same as alternative A except</i> increased public uses may contribute to invasive plant infestation and may delay habitat restoration.		<i>except</i> habitat restoration would be hampered by lack of personnel to accomplish invasive plant management as well as by adverse impacts from unmonitored public use.

Table 16. Summary matrix of environmental consequences for the draft CCP and EA, Lost Trail National Wildlife Refuge, Montana

	<i>Alternative A</i> (proposed action) –Biological potential emphasis –Compatible public use opportunities	<i>Alternative B</i> –Habitat and species protection –Maximum compatible, public use opportunities	<i>Alternative C</i> –Habitat restoration and natural processes –Minimum public use opportunities	<i>Alternative D</i> (no action) –Custodial management –Limited public use opportunities
HABITAT MANAGEMENT ISSUES	Forest Habitat Goal Enhance and maintain Douglas-fir, ponderosa pine, aspen, and cottonwood forested habitats within the context of the Fisher River watershed for migratory birds, species of concern, and other associated wildlife.			
Loss of water downstream due to restoration projects	Forests benefit from thinning and spacing of trees, prescribed fire, invasive plant control, increasing vigor, and insect resistance as well as wildlife value. All public uses in forests would be improved through improved habitat conditions.			<i>same as alternative A</i> → <i>except</i> habitat restoration would be hampered by lack of personnel to accomplish tree thinning and prescribed fire as well as by impacts from unmonitored public use.
Eradication of invasive plants				
Loss of grazing opportunities				
	Invasive Plant Goal Native plant communities, composition, occurrence, and density exist without degradation by invasive plants, and support associated wildlife.			
	Invasive plant control would be aggressively pursued through integrated pest management causing minimal and temporary air quality degradation, but benefiting habitats and wildlife. Native vegetation would be increased, precluding invasive plants from spreading to neighboring lands.	<i>same as alternative A</i> →		<i>except</i> that invasive plant control would be only sporadic and accomplished through partnerships and, rather than controlling spread, invasive plants would be only contained.

Table 16. Summary matrix of environmental consequences for the draft CCP and EA, Lost Trail National Wildlife Refuge, Montana

	<i>Alternative A</i> (proposed action) -Biological potential emphasis -Compatible public use opportunities	<i>Alternative B</i> -Habitat and species protection -Maximum compatible, public use opportunities	<i>Alternative C</i> -Habitat restoration and natural processes -Minimum public use opportunities	<i>Alternative D</i> (no action) -Custodial management -Limited public use opportunities
WILDLIFE MANAGEMENT ISSUES	Migratory Bird Goal	Preserve, restore, and enhance the ecological diversity and abundance of migratory birds of the intermountain west forest, wetland complexes, riparian habitat, and bunchgrass prairie.		
Foremost consideration for wildlife and habitats	Migratory birds benefit from improved habitat conditions and invasive plant control.			
Potential for the refuge to be an important habitat corridor	Richness and abundance of migratory birds increases with habitats being more diverse and providing for life cycle needs of birds.	<i>same as alternative A</i>		<i>except</i> that benefits to migratory birds would be realized over a longer period of time and may be hampered by a smaller area being manipulated to achieve habitat goals, and by adverse impacts from unmonitored public use.
Biological potential may be greater for deer, elk, and upland birds than for waterfowl	Public uses benefit from increased migratory bird presence. Minor negative impacts to migratory birds would occur during invasive plant control.	<i>except</i> that increased public use levels may have negative impacts on migratory birds due to encroachment and disturbance.		
Potential conflict between humans and presence of the gray wolf and grizzly bear	Other Wildlife Goal	Restore and maintain resident and endemic wildlife populations of northwestern Montana to maintain and enhance species diversity of Lost Trail National Wildlife Refuge and Pleasant Valley.		
Biological potential for reintroduction of trumpeter swan and Columbian sharp-tailed grouse	Mammals, birds, amphibians, reptiles, and fish would benefit from improved and diversified habitats.			
Determination of management techniques and expected effects	Natural cycles of wetlands, riparian corridors, grasslands, and forests would be reestablished, meeting life cycle needs. Negative impacts to amphibians and reptiles could occur during habitat and water manipulation, causing impact to their richness and short-term displacement.	<i>same as alternative A</i>		<i>except</i> benefits to wildlife are realized over a longer period of time and may be hampered by unmonitored public use.

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	<i>Alternative A</i> (proposed action) –Biological potential emphasis –Compatible public use opportunities	<i>Alternative B</i> –Habitat and species protection –Maximum compatible, public use opportunities	<i>Alternative C</i> –Habitat restoration and natural processes –Minimum public use opportunities	<i>Alternative D</i> (no action) –Custodial management –Limited public use opportunities
	Species of Concern Goal Contribute to the conservation, enhancement, and recovery of endangered, threatened, and species of concern populations in Lost Trail National Wildlife Refuge and Fisher River watershed.			
	Habitats would contribute to the conservation and recovery of species of concern. Visitors would be protected and harmful interaction between humans and listed species would be minimized through modifications of public use, when needed.	<i>same as alternative A</i>	<i>in addition</i> , some species of concern may be reintroduced to the refuge.	<i>except</i> minimal staffing hampers efforts to protect species of concern from inadvertent or unintended adverse effects from public use and activities outside the refuge.
<i>TRADITIONAL USE ISSUES</i>	Cultural Resource Goal Protect, manage, and interpret archaeological, cultural, and historical resources present at Lost Trail National Wildlife Refuge for the benefit of present and future generations.			
Protection of cultural sites Loss of a working ranch	Surveying and documenting many resources and sites with partners would help protect and maintain them. Educated public supports protection. Documented resources would minimize project delays. Impacts to resources may occur from outreach programs that generate increased use.	<i>same as alternative A</i> <i>in addition</i> , restoration of historic resources could provide facilities for refuge operations. Increased interpretation and education with the museum. Major increase in funding and staffing needs directed towards development of museum may decrease availability for other priority public use. Minimum refuge staffing would provide public use and law enforcement personnel.		Cultural resources would be maintained, protected, and documented when found. Documented resources help plan projects. Undocumented resources may delay, change, or stop projects. Resources could be inadvertently damaged. Minimum refuge staffing provides public use and law enforcement personnel.
	Sites protected through closures due to wetland restoration and endangered and threatened species concerns. Hydrological restoration may negatively impact historic sites.	<i>same as alternative A</i>		

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PUBLIC USE ISSUES	Provide quality wildlife-dependent recreational and educational opportunities for persons of all abilities to learn, understand, and enjoy the Intermountain ecosystem of northwestern Montana; its associated fish, wildlife, and plants of Lost Trail National Wildlife Refuge; and the National Wildlife Refuge System in a safe and compatible manner.			
Use that does not degrade wildlife habitat	Public Use Goal			
Desire to hunt on the refuge and access to hunt on neighboring lands	<i>Hunting</i> Allowing refuge access for hunting of deer, elk, turkey, grouse, and special hunts organized for youth, persons with disabilities, and archery would develops appreciation for public use and help manage wildlife and habitats.	Allowing refuge access for hunting of large mammals, grouse, and turkey develops appreciation for public use and helps manage wildlife and habitats.	Limiting hunting to special-permit hunts only for deer, elk, grouse, and turkey develops appreciation for public use and helps manage wildlife and habitats.	----- <i>same as alternative A</i> →
Desire to trap				
Desire for nature trails, fishing, horseback riding, snowmobiling, and cross-country skiing				
Need to prohibit recreational use				
Impacts to refuge habitats by timber company crews	<i>Fishing</i> Improved fisheries with fishing allowed if fish populations warrant.	Improved fisheries with fishing allowed regardless of population size; may have negative impacts on fisheries and eventually on public use.	Fisheries restored with no fishing permitted; may have negative impact on public perception and lack of recreational opportunities.	----- <i>same as alternative A</i> → <i>except</i> fisheries would take longer to develop and fishing experience may be lessened.
	<i>Wildlife Observation and Photography, Environmental Education, and Interpretation</i> An involved and educated public understands and supports resource conservation efforts and Service goals.	----- <i>same as alternative A</i> →		Minimally involved and educated public due to limits of existing infrastructure.
	Public information needs and service are met through contact station open at least 5 days a week and weekends during busy season.	----- <i>same as alternative A</i> → <i>except</i> contact station service provides 7 days a week.		

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<p>ADMINISTRATION ISSUES</p> <p>Retention of existing, and location of new, facilities</p> <p>Access to easements from the MPC</p> <p>Commitment of the Service to maximize potential for use of additional property</p>	<p>Administration Goal</p> <p>Provide staffing, funding, and facilities to maintain the long-term integrity of habitats and wildlife resources of Lost Trail National Wildlife Refuge in supporting the achievement of ecosystem and National Wildlife Refuge System goals.</p>			
	<p>Staff of seven full-time employees makes progress toward habitat restoration and management.</p> <p>Brochure and facilities upgrades improve public perception of refuge, leading to increased use.</p> <p>Public expenditures on wildlife-related recreation and refuge staff income boost the local economy.</p> <p>Livestock losses from predator recolonization could impact relations with neighbors despite monetary compensations.</p>	<p><i>same as alternative A</i> →</p>		<p>Staff of less than two full-time employees, with the help of volunteers, achieves custodial management.</p> <p>Minimal progress in habitat restoration would be achieved over a long period of time.</p> <p>Facilities would remain the same.</p> <p>No changes to the current socioeconomic situation.</p>
	<p>Partnership Goal</p> <p>Promote and develop partnerships with adjacent landowners, public and private organizations, and other interested individuals to preserve, restore, and enhance a diverse and productive ecosystem of which Lost Trail National Wildlife Refuge is an integral part.</p>			
	<p>Partnership RMEF would assist with elk management.</p> <p>New partnerships assist with refuge management including restoration of habitats, survey of cultural resources, control of invasive plants, environmental education, and law enforcement.</p>	<p><i>same as alternative A</i> →</p>		<p><i>except to a lesser degree, due to limited personnel and facilities.</i></p>

ENVIRONMENTAL JUSTICE

Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations, 1994) directs federal agencies to incorporate environmental justice in their decision-making process. Federal agencies must identify and address any disproportionately high and adverse

environmental effects of their programs, policies, and activities on minority or low-income populations.

Alternatives A and D would not have a disproportionately high or adverse environmental effect on minority or low-income populations. Public use and access to the refuge does not require a fee and is open to all the visiting public.

Alternative B may require some fee programs to help support the increase in public use and the infrastructure needed for a quality program. Any fees would need to be made equitable, so as not to exclude certain groups. However, the remoteness of the refuge may be a deterrent to certain populations.

The outreach programs in alternative C would reach into schools—many of which would be in urban areas and could expand to reach reservation schools. Environmental education programs would target youth and provide them with refuge experiences.

CONSEQUENCES COMMON TO ALL ALTERNATIVES

All alternatives would have the same impacts related to soils, as described below.

Much of the road on the refuge follows Pleasant Valley Creek. At high water, roads can become inundated and cause increased sediment loads to the creek. Increased visitation may increase the need for road maintenance. Some types of roadwork and use, and grazing practices at or near the refuge could increase sediment runoff into aquatic habitats and accelerate siltation.

The Pleasant Valley Creek restoration project would likely contribute very little sediment during or after construction. Erosion would be minimized through the use of sod mats, root wads, and woody vegetation, as necessary. The drainage channel from Dahl Lake would be filled—the lake would fill to a normal level each year, and seepage and evaporation would maintain that level without any overflow. No increased erosion or sedimentation is expected from this activity.

The organic soils around Dahl Lake are not subject to compaction; however, the sodium-affected soils on the lake terraces would be affected by compaction from increased foot traffic.

Uplands, where the slope is less than 8 percent, have few limitations relative to pesticide applications. Upland soils are generally deep with moderate permeability. Cobbles and stones in the surface layer may limit farming equipment in some areas.

Where there is native vegetation in the uplands, it is generally sufficient to protect against erosion. Runoff and erosion may occur where slopes are greater than 8 percent, particularly where the surface is disturbed or vegetative cover is lacking. Although the loamy surface layers are generally not susceptible to compaction from heavy equipment or foot traffic, the heavy equipment restrictions would reduce the likelihood of compaction.

Flooding and water tables are the main limitations for flood plain soils, relative to pesticide applications



Ray Washtak/USFWS

Upper Moose Pond

and farming operations. Bottomland soils are quite variable in their properties and limitations—permeability ranges from rapid on stream terraces to moderately slow on lake terraces. Floodplains have seasonal water tables at or near the surface and some areas are “ponded” for long periods in the spring.

Limited use of equipment and foot traffic on lake terraces would reduce the likelihood of compaction. The organic soils around Dahl Lake are wet all year. The high pH values in these soils severely limit reestablishment of vegetation.

RANGE OF ENVIRONMENTAL CONSEQUENCES

Environmental consequences of the alternatives are described for each major component of the environment.

Direct impacts on the environment from management actions are detailed, as well as indirect impacts. Some consequences, from various management actions on and off the refuge, may combine to create the potential for greater impacts, i.e., cumulative impacts.

AIR QUALITY

No adverse effects on air quality are expected.

DIRECT IMPACTS

Of the seven criteria pollutants under the NAAQS, carbon monoxide and particulate matter are the only two that may experience minor short-term changes with implementation of any of the alternatives.

Carbon Monoxide

Carbon monoxide is a gas that is released when carbon in fuels is not completely burned. In this area of western Montana, vehicle emissions and house furnaces would be the greatest contributors to carbon monoxide. Any alternative that increases vehicular traffic or housing would have the potential to affect carbon monoxide.

Most public use is expected to occur in the spring, summer, and fall. Alternative B, which proposes the greatest increase to public use, and hence the largest increase in vehicle travel, is not expected to have any impact on air quality. Even with a 10 percent increase in public use, no adverse affect in air quality is expected. Alternatives A and D propose smaller increases in public use. Alternative C would maintain or decrease public use.

Alternatives A, B, and C all support seeking conservation easements with willing neighbors. Conservation easements would decrease housing growth and decrease potential carbon monoxide emissions associated with heating.

Particulate Pollution

Carbon in the form of particulate matter would not have an adverse affect on air quality under any of the alternatives, using the same reasoning as was set forth under carbon monoxide. In the area of the refuge, carbon from automobiles and diesel engines; soot from slash burning, wildland fires, fireplaces, and wood stoves; and dust associated with wind-blown sand and dirt from roadways, fields, and construction sites can all contribute to particulate matter.

Vehicle Travel and Construction

Agricultural practices that disturb the soil and the use of the Pleasant Valley Road by recreationists and logging crews would increase particulate matter in the air. Gravel roads would likely be responsible for the largest portion of particulate pollution (PM₁₀) on the refuge. All alternatives permit hunting, which would lead to the greatest concentration of use during hunting season weekends.

Air quality would be affected by logging activity adjacent to the refuge. Particulate pollution (respirable into the lungs) would increase when

logging trucks are operating and during slash pile burning.

Alternative B—with provisions for fishing, camping, day use, environmental education, and nonmotorized boating—would have the most vehicle use, and is the only alternative that may decrease air quality. Alternative C, with minimal public use and administrative traffic, would have the least impact on air quality.

The implementation of the habitat development plan would occur in all alternatives. The use of heavy equipment may lead to local, short-term effects associated with dust from earthwork and engine exhaust. Alternative B provides for the most additional construction and would have the greatest short-term impact on air quality. Public use areas would be constructed to a lesser degree in alternative A. Alternatives C and D would have the least impact to air quality.

Prescribed Fire

The effects on air quality from prescribed fire should not vary significantly between any of the alternatives, although the number of acres burned and timing may vary. Prescribed burns would have minor, short-term impacts on air quality. The NAAQS for particulate matter may be approached for short periods of time in the area immediately adjacent to the burn, and for only 1–2 days. Air quality on a regional scale would be affected only when many acres were burned on the same day.

The greatest amount of prescribed fire may be seen with alternative C, where it is the only management tool to manipulate grasslands. Management of grasslands and forests would strive to mimic historic conditions with the use of fire and prescribed fire would be used more frequently than in the recent past. Alternative D would use prescribed fire least; it is the only alternative in which fire is not described as a management tool to maintain ponderosa pine uplands.

Wildland Fires

Wildland fire would be aggressively suppressed with the help of the Montana DNRC in Alternatives A, B, and D.

Since alternative C calls for the greatest amount of prescribed fire, the expected reduction of fuels may decrease the intensity and acreage of wildland fires. The impact of smoke from wildland fires could still be greatest under Alternative C, which does not include suppression support from DNRC, resulting in greater amounts of smoke for longer periods; even so, emissions should only affect the local area and be of short duration.

INDIRECT IMPACTS

Releases from any nearby facilities would likely have minimal impact on the refuge under all alternatives, as transport pathways are limited to aerial transport.

Two local facilities are listed on the toxic release inventory of the Environmental Protection Agency, for air emissions of toxic chemicals. An aluminum smelter (Columbia Falls Aluminum Company) and a fiberboard plant (Plum Creek Manufacturing) are located in Columbia Falls, and their emissions are not likely to reach the refuge in significant quantities.

Several other facilities in the airshed are monitored for emissions such as particulate pollution and volatile organic compounds, but these sources are typically more than 18 miles away and are separated from the refuge by mountains.

CUMULATIVE IMPACTS

Cumulative impacts would be the same for all alternatives. Smoke and dust may be trapped in mountain valleys by temperature inversions.

Wildland fires could be larger, and produce more emissions, under a suppression strategy that uses natural and constructed barriers as control lines, compared to fires that are suppressed with an aggressive, direct-attack strategy. The relative size of fires is still expected to be so small as to have little overall impact.

HYDROLOGY

No adverse impacts on refuge hydrology are expected.

DIRECT IMPACTS

Hydrologic restoration called for in alternatives A–D would result in various combinations of the following:

- recharge and maintenance of wetland complexes
- maintenance of or increase in open water on Dahl Lake
- restoration of temporary wetlands to seasonal and semipermanent conditions

One-third of drained wetlands would be recharged to 75–100 percent of their capacity under alternatives A, B, and D. Maximum water management under alternative B would occur in all refuge basins and increase open water in Dahl Lake to 260 acres. In contrast, under alternative D, Meadow Creek would be restored to a series of wetland complexes, and wetlands in the Dahl Lake complex would be restored from temporary to seasonal and semipermanent conditions. In

alternative C, drained wetlands would recharge and function naturally after removal of structures, resulting in restoration of Dahl Lake and semipermanent and temporary wetlands.

INDIRECT IMPACTS

Hydrologic restoration would create larger and more diverse wetland and grassland habitats under all alternatives. It is expected that implementation of all alternatives, with their associated hydrological changes, would have varying degrees of beneficial effects on wildlife that inhabits or migrates through the refuge.

Additional allocations of water may be required for the hydrologic restoration called for in all alternatives. A doubling of wetland acres would require a water right change application and possibly a request for additional water. The largest component of the additional water would be to offset evaporation of the new surface water that would be impounded. It is unknown whether there is a reliable source of water to accomplish this.

Logging and road building on adjacent PCTC lands would likely increase sediment loads to several streams flowing into the refuge, as well as to Pleasant Valley Creek. The groundwater-fed system of Dahl Lake should be immune to sedimentation, as all streams terminate before reaching the lake, except in high runoff years. Sedimentation may impact the existing fishery or impair attempts to improve the fishery on the refuge.

Water temperatures in Pleasant Valley Creek should be decreased in alternatives A and D, as a result of revegetated channel sections along the creek that would provide bank stabilization and cover.

Invasive plant control is likely to have minimal impacts in all alternatives. The avoidance of herbicide application during rain events and to areas with a shallow groundwater table or near streams or lakes, would reduce the risk of the water-soluble clorpyralid methyl and picloram being entrained in runoff or leached into groundwater. The refuge may sustain impacts from contaminants resulting from activities on adjacent lands and nearby facilities.

CUMULATIVE IMPACTS

Increased public use under all alternatives would increase the demand for public toilets by visitors and domestic water by employees. Additional water and permits to accommodate the expanded needs would need to be obtained. This is not expected to be a problem, as the state of Montana is known to support applications for domestic well use.

HABITAT

Habitat restoration in alternative C would occur over a longer period of time in comparison with alternatives A, B and D; recolonization of certain wildlife species might also take longer.

The control of invasive plants is a major factor in the restoration and maintenance of wildlife habitats. Alternative A would restore native species without herbicide use, and may release sedges and other native species. As native plants recolonize the area, plant species diversity would increase and provide more diverse food sources. Subsequent wildlife diversity, as well as abundance, could increase with the increase in food. The impacts of invasive plant control under alternative B would have greater benefits to native species than alternative A.

There is not nearly as much public use in alternative C as in the other alternatives. This should lead to a decrease in ground disturbance from parking areas, trails, and vehicle use, with much less dispersal of invasive plants.

In alternatives A and D, public access points (for fishing, observation, and photography) could restrict impacts to soil and vegetation to limited areas (Douglas et al. 1999).

With limited staffing on site under alternative A, staff from the National Bison Range would continue to provide collateral effort for control of invasive plants, until a maintenance worker and biologist are added at the refuge. This would limit control efforts to the stated average of 200–400 acres. The refuge would garner funding and recruit volunteers to continue and expand control efforts.

Impacts of management actions on specific habitats, as described in the alternatives, are displayed below.

DIRECT IMPACTS

Although habitats are arranged in complex mosaics of different-sized components, consequences are described below for these general habitat types: riparian and wetland habitats, grassland habitat, and forest habitat.

Riparian and Wetland Habitats

Alternative A promotes a more natural vegetative composition and structure, and would increase riparian shrubs varying in cover densities. Bare ground would be a short-term impact associated with stream restoration, when there may be some risk of invasive plant establishment. Increased riparian shrub cover would lead to a long-term decrease in nonnative foxtail occurrence on streambanks.

In alternative A, the wetland restoration program with the NRCS to restore Pleasant Valley Creek

would increase riparian vegetation along the creek's southern end before it turns west and just north of Lower Moose Pond. Plantings of willows and alders would provide understory and midlevel understory in an area currently devoid of healthy, native, riparian vegetation. Spacing and protection from ungulate browsing would increase the success of riparian vegetation restoration.

Natural, diverse, wetland vegetation (cattail, bulrush, sedge, and other rushes) would be restored in areas previously dominated by reed canarygrass, under alternative A. This increase in native vegetation would provide greater biological integrity than the monoculture of reed canarygrass.

Sections along the Pleasant Valley Creek channel would be revegetated with herbaceous and woody wetland plant species, under alternatives A and D.

Riparian area and wetland impacts are mostly the same for alternatives B and D as those described for alternative A. In alternative D, however, willow, birch, and alder would likely die out on the north end of Pleasant Valley Creek, where vegetation plantings would not occur. Alternative B's greater manipulation of water levels would provide control of flooding and drawdown regimes and lead to more control of wetland vegetation.

As wetlands return to a normal seasonal fluctuation under alternative C, wetland vegetation would reestablish without further manipulation.

The wetlands recharged in alternatives B and C would provide emergent vegetation and invertebrate foods for foraging habitat and nesting/brood cover. The variety of wetlands would provide enough interspersed open water to emergent vegetation to meet the needs of many species.

Grassland Habitat

Alternatives A–C would restore upland grasslands to native species. Native, upland grasslands would not be restored under Alternative D; however, vegetative structure beneficial to wildlife would be maintained.

In all alternatives, upland, grass communities would be maintained through prescribed burns. The net loss of prairie to Douglas-fir and ponderosa pine encroachment would be halted, and grasses and other forage favored by wildlife would be enhanced. In some cases, thicker duff layers and dense, dry crowns resulting from fire exclusion could allow heat to penetrate deeper and kill vegetation; however, risk of a severe fire would be less where past grazing practices have reduced vegetative build-up.

- Idaho fescue has been reported to be more sensitive to fire than bluebunch wheatgrass (Conrad and Poulton 1966). Rough fescue seems to be well adapted to periodic burning. Spring and late fall burns on Idaho and rough fescue sites—

with good soil moisture, during plant dormancy, and with favorable Idaho fescue root reserves—are thought to injure plants less, yet late-season burning results are varied for both fescues (USDA Forest Service, fire database). Drastic reductions in rough fescue seed production may occur following spring burning (Bailey and Anderson 1978).

- Western wheatgrass increases in abundance and density after a fire. Spring burns, after new growth on western wheatgrass, can severely injure this species (Volland and Dell 1981).
- Vigor has been seen to return 2–5 years after a fire for Idaho and rough fescue and western wheatgrass, with an increase in protein content for Idaho fescue (Launchbaugh 1964, Phillips 1973, Stubbendieck et al. 1986, Singer and Harter 1996).

Periodic burning would not occur as frequently in alternative D as in the other alternatives due to staffing constraints. With little use of fire Douglas-fir would encroach into prairie grasslands, woody shrubs would increase, and this ecosystem would gradually degrade.

In alternative A, the occasional grazing of native, upland, bunchgrass prairie is expected to stimulate plant vitality and play a beneficial role in community stability, through timely grazing of plants and moderate use of the community.

- Bunchgrasses in general can tolerate light grazing after seed formation (Miller 1986). Idaho fescue is sensitive to the amount of grazing, dependent on soil type, competition, existing vigor condition, and moisture regime (Pond 1960, Johnson 1994). Idaho fescue is most sensitive to defoliation from flowering to seed ripening (Mueggler 1967, Miller 1986, Johnson 1994). Pond (1960) found the vigor of Idaho fescue significantly reduced on areas where 50 percent or more of the current year's height growth was used. An interesting note is that Jones (1965) found fescue decreased with cattle grazing, but remained relatively unchanged by elk grazing.
- Repeated grazing may reduce the ability of Idaho fescue to compete with spotted knapweed when both are grazed (Olson and Wallander 1997). Grass defoliation in spring increases spotted knapweed cover compared to summer defoliations (Jacobs and Sheley 1999).
- Rough fescue is a highly palatable species and is extremely susceptible to grazing and trampling damage; however, light grazing does not reduce overall plant vigor (Johnston 1961, Mueggler and Stewart 1980).
- Western wheatgrass can tolerate moderate grazing, but is damaged from close spring grazing (Wasser 1982). Proper grazing can help prevent plants from becoming too coarse as a forage species for wildlife or livestock (Rogler 1973).

Allowing carryover of 40–50 percent of the current year's growth would maintain these bunchgrasses and not result in resource damage.

Without grazing, under alternative C, upland grass growth may become decadent. For plants without light or moderate grazing for several years, growth would be slower and plants would not grow as tall, and would have less weight and numbers of seed stalks than comparable plants that were grazed (Ganskopp and Bedell 1981).

More native grasses in bottomland grasslands would be maintained in alternative A, providing the healthiest system of native grasses. This may lead to more residual vegetation than normally maintained for these types of grasses, but would not have much effect on vegetative structure.

Alternative B would maintain more tame grasses in bottomland grasslands; however, good vegetation structure would exist and have no detrimental effect on waterfowl nesting cover.

A vigorous medium-tall grassland around Dahl Lake would be provided under alternatives A and B. Vegetation would be maintained in a vigorous state in alternatives A and B.

Alternative A would restore a large portion (85 percent) of the foxtail infestations to native grasses and sedges. This would increase plant diversity, which would foster maintenance of the biological integrity of the system. Results would occur quicker and with greater cost efficiency within the WRP easement, through collaboration with the NRCS. More acres of foxtail reduction would occur in alternative D than alternative A.

Foxtail restoration would not be as extensive in alternative B as in alternatives A and D. Some acreage of tame grasses would be maintained rather than bare ground, which should decrease the risk of increasing invasive plants in these areas.

All foxtail areas would be restored in alternative C, which should result in a greater benefit for maintaining native grass communities. Spotted knapweed would be reduced to less than 10 percent by 2007. With careful herbicide application, reduction of knapweed should release native species for a quicker response and over a much larger area.

Forest Habitat

Alternatives A and C would promote, through prescribed fire, a more natural forest composition and structure, with increased tree vigor and spacing to combat insect infestations. Thick second-growth would be reduced for an altered age-class structure in the forest. Some snags could be lost during the extensive prescribed fire program. Prescribed burning would be conducted in a much more patchy nature in alternative A than in alternative C.

- A healthy ponderosa pine-dominated forest (south-facing slopes) and Douglas-fir-dominated forest (north-facing slopes) would be maintained.
- Forests would contain large trees, abundant snags, and a dense herbaceous layer.
- Trees and shrubs of varied sized and age classes would have increased robustness.
- Shrub thickets would occur in increased density and be more continuous.
- Recruitment of young trees and shrubs would create more complex vertical structure.
- Forests would be at low risk to severe damage by wildland fire and epidemics of insects and disease.

The lack of fire in the ecosystem under alternative D would continue the trend away from fire-adapted species. Forest health would decline. The increase in fire-intolerant species would shift composition toward the more shade-tolerant Douglas-fir, and contribute to the loss of wildlife forage (Gruell et al. 1982). The increase of Douglas-fir would more likely be heavily infested with dwarf mistletoe, which would increase ladder fuels that contribute to catastrophic (stand-replacing) wildland fires.

Alternative A would maintain or increase the coverage of aspen groves. Regeneration would provide the recruitment necessary to replace older trees as they die. Aspen stands regenerate naturally in a fragmented or linear nature with a mix of age structures, which would increase the habitat structure complexity and diversity.

Unmanaged aspen and midstory riparian vegetation, under alternatives C and D, may result in degraded habitat conditions and reduce the quality of habitat for wildlife and plant species. Aspen groves would continue to age, remain simpler in structure, and have insufficient regeneration to establish new age classes. Without management intervention, these habitats would likely die out.

INDIRECT IMPACTS

The hydrologic restoration in alternative A would result in the slow fill of Dahl Lake (for greater surface acreage) with naturally occurring runoff and collection, with no increase in turbidity nor reduction of seed stocks for establishing emergent vegetation (Weller et al. 1991). Water levels should increase gradually to avoid scouring turbidity and plant mortality (Weller 1981). Wildlife would benefit from an increase in temporary, seasonal, and semipermanent wetlands (i.e., foraging and nesting habitat) with restoration of natural functioning in the Dahl Lake wetland complex.

An increase in temporary wetlands, due to hydrologic restoration, would likely increase emergent vegetation coverage (cattail, bulrush, and reed canarygrass), in alternative A. Existing

emergent vegetation may be flooded out as water capacity increases. Rewatering of saline areas may alter the vegetation composition, since salinity has a strong influence on the dominant plants.

Alternative C would facilitate natural succession toward a climax state for refuge habitats. This would be beneficial to grassland- and riparian-dependent wildlife species, but may discourage use by wetland- and forest-dependent species as wetland and forest habitats decrease in size and composition.

Under alternatives A, B, and D, ground disturbance from parking areas, trails, vehicles, and seeds carried on clothing and shoes could increase the amount of invasive plants or bring in new invaders.

Biocontrol of invasive plants under alternative A could potentially have the negative effect of altering native insect communities. This could lead to reduced numbers of pollinators, which would subsequently impact the maintenance and dispersal of certain flowering plants.

In alternative A, herbicide use for control of invasive plants is expected to have no detrimental effects resulting from too much herbicide in one location. Because of great care in application, there would be negligible risk of an aerial spray such as Tordon drifting into forested areas and killing young trees, and negligible impacts from herbicide in water systems.

In alternative C, there may be more risk of herbicide-spraying impacts occurring in one area or drift problems associated with more aerial applications, due to treatment of most areas of spotted knapweed by 2007.

CUMULATIVE IMPACTS

There may be cumulative impacts resulting from livestock grazing under alternative A. Grazing impacts may be increased in grazed areas by aboveground herbivore grazing, facilitating grazing by below-ground herbivores (Ingham and Detling 1984).

WILDLIFE

Limited manipulation of habitats, coupled with decreased human impacts, in alternative C would have positive effects on wildlife composition and use of the refuge. Habitat restoration would occur over a longer period in comparison with alternatives A, B and D; recolonization of certain wildlife species might also take longer.

By developing specific areas for wildlife observation and photography and restricting recreation to predictable patterns in alternative A, wildlife disturbance would be limited. Trails, wildlife-viewing areas, and platforms would offer quality viewing opportunities and draw users away from

sensitive areas, minimizing the negative effects (Youmans 1999, Canfield et al. 1999, Hamann et al. 1999).

In alternatives A and B, limiting the public's movement through use of designated viewing and photographic sites would restrict users from following wildlife. Wildlife are mobile, may range a large distance, and may find sanctuary in closed areas if there is too much use at designated sites. However, these restrictions may also encourage more wildlife to use the refuge, particularly for sensitive activities such as bearing and raising young and wintering.

Under alternative B, disturbance from the public would be increased over all other alternatives where floating devices would be allowed on Dahl Lake and access into the closed area would be permitted.

Education and development of awareness and appreciation for wildlife and the Refuge System would be greatest under alternative B. There would be a positive influence on the acceptance of threatened and endangered species in alternatives A and B, by increasing awareness and providing accurate information through the interpretive program. This would not occur in alternatives C and D.

Environmental education in Alternatives A–C is expected to result in limited disturbance to natural resources.

In alternative A, habitat would be protected through the use of conservation easements. Conservation easements can be vital to the preservation of wildlife habitat, habitat integrity, and maintenance of open space. Conservation easements would also benefit all wildlife by decreasing habitat fragmentation and decreasing human–wildlife conflicts.

Specific impacts of management actions on species groups, as described below, are described in the following section.

- migratory birds
- large mammals
- small mammals
- resident birds
- amphibians, reptiles, and fish
- species of concern—grizzly bear, gray wolf, Canada lynx
- species of concern—bald eagle, trumpeter swan, black tern
- species of concern—boreal toad, bull trout
- species of concern—Spalding's catchfly

MIGRATORY BIRDS

Estimated effects of the alternatives on migratory birds are described below.

Direct Impacts

Migratory waterfowl would benefit from larger and more diverse wetland and grassland habitats in all alternatives.

In alternatives A, C, and D, enhancing riparian habitats by replanting alders, willow, and hawthorn would provide much additional stream vegetation, benefiting habitat for Neotropical migratory birds such as the willow flycatcher. Restoration of wetlands to historic conditions and functions should result in a mosaic of wetland types with healthy, robust, emergent plant communities and varying degrees and depths of open water, providing habitat for a diversity of water birds.

Dahl Lake would be increased slowly under alternative A, so there would be no net decrease in vegetation types important to waterfowl and other water birds. A short-term negative impact is expected as restoration efforts change water levels and shoreline vegetation. For instance, increasing Dahl Lake by 200 acres in one year may eliminate both shoreline vegetation and submergent vegetation. After restoration is complete, natural wetland function and protection from livestock grazing would encourage the establishment of wetland vegetation. Reduction in grazing and management for robust wetland vegetation may have a negative impact on shorebirds.

Providing a mosaic of wetland types, as proposed in alternatives A and C, with a healthy, robust emergent plant community well-interspersed with open water would provide habitat for a diversity of waterfowl and other water birds such as American bittern and grebe species. There would be some decrease in waterfowl habitat under alternative C, as water control structures are removed; however, restoration of drained wetlands would result in a net increase in wetland habitat in the bottomlands. In alternative D, restored wetlands would occur only on the NRCS easement.

Restored native plant diversity in the grasslands would result in expanded food and nesting habitat for a variety of water birds in alternatives A, C, and D. A mosaic of native grasses in various stages of succession would cover the landscape, providing habitat for a diversity of birds. Restored grasslands would be in a vigorous state for waterfowl nesting habitat. Vigorous medium-tall grassland around Dahl Lake would provide waterfowl-nesting habitat, along with benefits to species such as the short-eared owl, savannah sparrow, meadowlark, and northern harrier.

There would be less native grassland restored under alternative B. Grassland habitat management would be similar to alternative A with similar impacts. Foxtail restoration would not be as extensive in alternative B as in alternatives A and D (only 35

percent of the creeping meadow foxtail would be restored). Although not a native, and monotypic in nature, foxtail can be nesting cover and may provide for more migratory bird and waterfowl use of the area than under alternatives A or D. Maintaining the areas in tame grasses rather than bare ground should decrease the risk of increasing invasive plant coverage in these areas.

Alternative B would have the greatest positive impact on water bird numbers. Increased constructed nesting habitat may increase waterfowl production. Wild rice plantings for forage would maximize local waterfowl production (alternative B). Wild rice has been shown to attract and concentrate large numbers of breeding waterfowl and may increase nest success and duckling survival (Peden 1977, Huseby et al. 2001). Increased invertebrate food sources and emergent vegetation for foraging and nesting habitat would be available in alternative B, which would restore all ponds and install water control structures.

The use of habitat improvement tools such as prescribed fire and mowing in all alternatives would have minimal impact on ground-nesting migratory birds, including ducklings and molting birds. Prescribed burns and mowing would be timed to reduce impacts on nesting birds (burn after nesting and molting seasons).

Species such as mountain bluebird, loggerhead shrike, killdeer, and rock wren would respond positively to the occasional use of grazing to restore vigor to grasslands, as used in alternatives A, B, and D. Species such as willow flycatcher, savannah sparrow, short-eared owl, orange-crowned warbler, and lazuli bunting would be negatively affected by grazing (Saab et al. 1995).

Authorized waterfowl hunting (when fall populations average more than 1,000 ducks) would result in a reduction in waterfowl numbers from direct take as well as displacement due to disturbance, under alternatives A, B, and D.

The revegetated channel of Pleasant Valley Creek under alternatives A and D would provide plants such as alder, willow, and hawthorn, which would provide habitat for passerine birds such as the willow flycatcher, a MPIF species of concern.

Indirect Impacts

Designated access for fishing and wildlife observation and photography, under alternatives A and C, would have a positive impact on waterfowl, by providing localized and somewhat predictable disturbance to waterfowl. Birds react less negatively to predictable use, and waterfowl are less disturbed by predictable shoreline activity than overwater use (such as boats, both motorized and nonmotorized) (Hamann et al. 1999). Studies have shown that unpredictable and erratic disturbances

by humans have the greatest negative impacts on wildlife (Canfield et al. 1999).

Restricting the public to designated trails in alternatives A, B, and C would minimize disturbance to waterfowl and Neotropical migratory birds during critical periods of the annual biological cycle. Neotropical migratory respond to human disturbance by altering their behavior, spatial distribution, and use of habitats (Hamann et al. 1999). Miller et al. (1998) found lower nest success and density adjacent to, rather than removed from, trails in Colorado.

Early waterfowl nesters may be subject to disturbance prior to May 15, especially with the open spring turkey-hunting season. Disturbance from public use in alternative A may lead to a decline in waterfowl populations by:

- decreasing the number of pairs using the area;
- increasing the nest-desertion rate;
- reducing hatching success;
- decreasing duckling survival.

The potential for impacts on nesting waterfowl and other water birds from disturbance is greatest in alternative D, which would allow unrestricted access for authorized public use except in the designated area from September 1 to December 15.

If a viable sport fishery is established in alternatives A and B, this use would increase disturbance to water birds by attracting the public to wetland areas. Impacts from public use would be the highest in alternative B, where public use is promoted and a substantial increase in user days is predicted.

In all alternatives, fence removal (to meet large mammal objectives) would benefit migratory birds by reducing the chance of collision and death. In addition, cowbird parasitism may be reduced. Fences provide perches from which cowbirds can search for host nests (Johnson and Temple 1990). A reduction in grazing should also reduce cowbird numbers.

Although bald eagles prey on waterfowl, increased numbers of eagles under all alternatives are not expected to impact waterfowl populations.

Depredation of ducklings by bullfrogs would be minimal in alternative A; bullfrogs are known to occur in Pleasant Valley; monitoring of bullfrog habitat and subsequent control of bullfrogs would be done. There may be impacts to ducklings in alternatives B, C, and D, where no monitoring for bullfrogs would be done.

Species diversity of Neotropical migratory birds would be maximized in alternative C, which manages habitats from a landscape level. Since migratory birds are so diverse, management of

habitat to benefit one guild would ultimately harm other species.

Cumulative Impacts

[None expected for all alternatives.]

LARGE MAMMALS

Estimated effects of the alternatives on large mammals are described below.

Direct Impacts

Vigorous, native grasslands, with reduced invasive plants in alternatives A and C would provide not only palatable, but nutritious, forage for deer, elk, and moose. Native grasslands support a diversity of plants that are critical to herd health. Although a plant may be desirable at a specific time of year and may supply some crucial nutrients, variety is necessary to provide the complexity of nutrients needed such as proteins, fats, carbohydrates, minerals, and vitamins. There may be a short-term negative effect on large mammals as grasslands are restored to native plants. Alternative C would have short-term negative effects on large mammals during the restoration process, as invasive plants are eliminated and desirable forage is established.

Although a slight positive impact on large mammals would occur as forage vigor is restored through rest from livestock grazing, restoration to native habitat would not occur in alternative D.

Removal of fences in all alternatives would have a beneficial impact on deer, elk, and moose. Fences can be harmful to wildlife by: impeding movement away from predators, restricting access to forage, and causing entanglement.

Hunting would impact deer and elk through direct take and disturbance, in all alternatives. Hunting pressure has always been high on private and public land surrounding the refuge, yet local wildlife populations remain healthy. Hunting would keep wildlife populations in balance with available habitat. Since the refuge has never been open to public hunting, implementing this program may lead to elk movement and redistribution with corresponding overpopulation problems in localized areas, including private lands.

In alternatives A and C, disturbance and stress to deer and elk would be decreased in winter and early spring, as a result of public use restrictions. Public use objectives are more restricted in alternative C, with access confined to designated roads and trails, except during the hunting season. Impacts to large mammals from disturbance should be minimal.

- Opening the refuge to other public uses such as wildlife observation may affect large mammal populations through disturbance. Disturbance may cause flight responses that result in young

becoming separated from adults, leaving them more vulnerable to the elements and predation.

- Disturbance could force animals off highly nutritious summer and fall range, onto less productive range. This may result in poorer body condition going into winter, which has been linked to lower reproductive performance and even death (Geist 1978).
- Early fall movements may also leave nutritious summer forage uneaten at the cost of overgrazing winter range. In winter, deer, elk, and moose may be restricted by disturbance to smaller areas with less nutritious forage. They would expend additional energy to remain warm and to travel through deep snow. Elk require almost 40 percent more food in winter to generate energy for daily metabolic activities (Nelson and Leege 1982).
- Deer, elk, and moose are in their lowest physical condition in the spring. Until they can regain weight, these animals may succumb to stresses that would be considered minor at other times of the year. Constant disturbance may keep animals off important forage resulting in lower weight gains and lower birth rates.

With maximum public use in alternative B, an educated public understands the importance of winter range to deer and elk and the effects of disturbance, but there are no access restrictions. Disturbance may be greater, however public use would continue unless serious population decreases are recognized. Directing the public to sites of high animal use may cause increased stress to animals in important habitats or may cause the sites to be abandoned completely. Impacts may be offset by directing the public use to specific areas, limiting overall disturbance.

Unrestricted access under alternative D, except for a fall closure in the designated area, may increase widespread disturbance to wildlife throughout the year; however, current levels of public use are low and public use would not be promoted.

Since Lost Trail is a new refuge, management practices may result in large mammal populations increasing beyond the carrying capacity of the refuge. Animals may concentrate in areas of high use, resulting in vegetation damage. Harassment by hunters and other public users may cause large mammals to overuse areas with less disturbance. Large mammal populations move freely across refuge boundaries and it would be difficult to manage for a specific number of individuals given the size of their range and seasonality of refuge use.

Indirect Impacts

Forage and cover would be enhanced with accomplishment of riparian vegetation restoration in alternatives A and B—with increased aspen groves and potentially increased willow, birch, and alder.

Restoration of Dahl Lake may negatively impact large mammals as the lake rises and riparian vegetation is flooded, but should ultimately increase forage as the lake stabilizes at a higher level with more edge for willow, aspen, and birch.

The conversion of large areas to wild rice in alternative B would be beneficial to moose, but it is not preferred forage for other large mammals. Conversion to wild rice may impact large mammals by reducing winter forage.

Public use restrictions associated with species of concern may indirectly benefit deer, elk, and moose by reducing disturbance, for all alternatives.

Reestablishment of a pack of wolves to Pleasant Valley in all alternatives may have a negative impact on deer, elk, and moose—all of which are prey of the gray wolf. Wolves in the Greater Yellowstone area are shown to have a kill rate of 12–15 ungulates per wolf per year. Improvement in deer, elk, and moose habitat may be enough to offset any decrease in their populations from increased predation.

Conservation easements established to enhance other species (alternative C) would benefit large mammals by limiting subdivisions and maintaining a rural environment.

Cumulative Impacts

Although fostering predator populations such as the gray wolf and grizzly bear and eliminating livestock grazing from the refuge may increase predation on large mammals, predation alone should not have a major impact on populations. Predation coupled with other detrimental factors such as increased hunter harvest or severe weather patterns may have a negative impact on large mammal species. For example, when a higher than normal number of female deer die in any given year from things such as hunting or a severe winter, local conditions could exist where wolves and other predators may keep deer numbers suppressed or slow population growth.

SMALL MAMMALS

Estimated effects of the alternatives on small mammals are described below.

Direct Impacts

Restoration to native habitat and improvement in vigor in alternatives A and B should have positive effects on most small mammals, providing more cover and forage. Reduction in livestock grazing and improvement in vigor of grasslands may have a negative impact on ground squirrels. Restoration efforts in alternatives C and D would have short-term negative impacts on small mammals as habitat is eliminated. As restoration is accomplished and healthy native vegetation is reestablished, mammal populations should rebound.

Ground squirrels would benefit from restrictions against sport shooting of this species in alternatives A, B, and D. Ground squirrel numbers would be kept in check by the improved health and density of native vegetation, as well as by a diverse predator base.

Restoration of wetlands in alternative A would benefit semi-aquatic mammals such as beaver, river otter, mink, and muskrat. Planting and encouraging shoreline vegetation (willow, cottonwood, and aspen preferred by beaver; cattail, bulrush, and sedge preferred by muskrat) would benefit these species by providing forage and bank stabilization.

Restoration efforts in alternatives A and D would also help stabilize water levels and benefit semi-aquatic mammals. These animals are sensitive to fluctuating water levels that may cause flooding of dens or expose dens to predators. Manipulation of water levels through the use of water control structures in alternative B may have adverse impacts on these species.

Semi-aquatic mammals may be impacted by disturbance in the uplands in alternative A. The elusive behavior of these species and the importance of secure den sites, indicates they have a low tolerance for human presence. Disturbance would be minimized during spring, early summer, and fall in alternatives A and C. The immediate postnatal period is critical to these mammals, and fall is also a critical time as they are often out of the water and more susceptible to disturbance while they build houses and cut stems for caches.

Increased public use around wetlands and riparian areas in alternative B may impact semi-aquatic mammals. Unrestricted public access for most of the year in alternative D may have a negative impact on these species.

If a sport fishery is established in alternative A, disturbance may increase as more people use the water's edge. Abandoned fishing line may cause a hazard by trapping and entangling. These animals would not be impacted by the effects of boating (disturbance and bank erosion from wave action) as public boating would be restricted. Minimal, short-term impacts could occur from administrative use of boats.

Indirect Impacts

In alternative A, an increase in predators due to management for gray wolf, grizzly bear, and Canada lynx and prohibition of trapping may have a slight negative impact on small mammals.

A substantial reduction in ground squirrel numbers would adversely affect those species that prey on them. Ground-nesting birds may also be negatively affected as predators switch to alternate prey sources.

Small mammals would not be impacted by recreation in alternative A, except possibly in sensitive habitats. There may be localized, minimal impacts on small mammals from the construction of facilities such as the wildlife-viewing areas and trail. Fens (bogs) and subnivalian (i.e., beneath snow) areas are sensitive habitats. Compaction of snow due to snowmobiles and other off-highway vehicle use would inhibit small mammal movement beneath the snow, reduce the insulative character of snow, and increase mammal mortality. There may be a slight increase in snow compaction from administrative activities.

Designated access for fishing and wildlife observation, under alternatives A and D, would have a positive impact on semi-aquatic mammals, by providing localized and somewhat predictable disturbance. Studies have shown that unpredictable and erratic disturbances by humans have the greatest negative impacts on wildlife (Canfield et al. 1999). Waller et al. (1999) found that beaver, muskrat, river otter, and mink may habituate to recreational activities if they occur in predictable areas.

Controversy exists over whether there are indirect effects of biological control (to reduce invasive plants) on nontarget species.

- Pearson et al. (2000) demonstrated the establishment of a biological control agent (*Urophora* spp.) that altered deer mouse diets and habitat selection by effecting changes in foraging strategies. This could result in spiraling changes to the food web.
- For example, a small mammal population increase could be followed by an increase in predators such as raptors, fox, and skunk, which also prey on ground-nesting migratory birds.
- On the other hand, increases in small mammals have been shown to result in less nest predation because predators are using small mammals as alternative prey.
- In addition, high populations of small mammals could result in increases in ground disturbance from tunneling, which often provides perfect sites for invasive plant dispersal.

Cumulative Impacts

[None expected for all alternatives.]

RESIDENT BIRDS

Estimated effects of the alternatives on resident birds are described below.

Direct Impacts

Alternative A would maintain viable populations of cavity nesters. In forest habitats, retention of all large snags and broken-top trees, and management for adequate numbers over the landscape, would

benefit species such as woodpeckers, sapsuckers, nuthatches, and flammulated and western screech-owls.

Indirect Impacts

Biotic transport of contaminants is a possibility, especially if nearby cattle ranches use Famphur to control parasites. This insecticide can be applied as a pour-on to the backs of cattle, and at recommended doses, can result in magpie die-offs (Eisler 1994). Magpies can pick up lethal doses of Famphur by ingesting cattle hair from rubs or directly from the backs of cattle. Food chain poisonings from Famphur can include eagles, hawks, and owls (Eisler 1994).

Cumulative Impacts

[None expected for all alternatives.]

AMPHIBIANS, REPTILES, AND FISH

Estimated effects of the alternatives on amphibians, reptiles, and fish are described below.

Direct Impacts

Reduced water temperatures in alternative A, and to a lesser extent in alternative D, would enhance amphibians and the native fisheries. Enhancing riparian habitats by replanting alders, willow, and hawthorn would provide much additional stream vegetation, which would foster a reduction in water temperature.

Breeding, wintering, and foraging habitat for many amphibians would be increased through enhancement and restoration of streams, lakes, ponds, and wetlands in alternative A and to a lesser extent in alternative D; however, results may be positive to one species and negative to another.

The complexity of habitat and life history requirements of amphibians and their susceptibility to environmental change makes protection of these species difficult under any alternative. Data gathered in alternatives A, C, and D would enable protection of identified populations, as well as help identify appropriate management.

In alternative A, amphibians and small aquatic reptiles would be protected from bullfrog predation and displacement, as bullfrog populations are identified and controlled. Bullfrogs would not be monitored in alternatives B and D, and may become established.

Fish habitat would be enhanced in all alternatives—improved stream pool-to-riffle ratios, restored stream meander, increased water for emergent vegetation, and raised stream grade to raise the groundwater table. The Pleasant Valley Creek restoration in alternative A would benefit native fish. If determined feasible, improved fish passage on and off the refuge would lead to restoration of native fisheries.

Indirect Impacts

Any change in water manipulation or water levels could result in the loss of key breeding, overwintering, and foraging habitats for amphibians and reptiles.

Water impoundments that are developed for waterfowl production, as in alternative B, may lead to a decline in amphibians and reptiles through increased depredation from a high concentration of waterfowl. High waterfowl numbers could lead to a decrease in water quality. Adult amphibians are very sensitive to environmental conditions due to their permeable skin, which they use to breathe and absorb water. Risk from slightly increased numbers of waterfowl would occur in alternative C.

In alternative B, manipulation of water levels in impoundments may cause mortality to amphibian eggs and larvae through exposure and increased risk of predation. Increased water levels may decrease water temperature, stopping the development of eggs or slowing development, and preventing maturation.

Restoration of habitat in alternative C may have a short-term negative effect, as reptiles and amphibians are highly sensitive to changes in environment. The removal of dikes and wetland structures may eliminate habitat. Restoration of drained wetlands would mitigate this loss for species that are adaptable or pioneering. Philopatric species may be lost.

Amphibians and reptiles would benefit from control of invasive plants in alternatives A–C. Invasive plants may impact terrestrial amphibians and reptiles by forming dense stands and changing microhabitats, blocking migration routes, and eliminating critical habitat. Conversely, management of invasive plants with chemical herbicides may have major negative impacts on these animals. Although the assumption is that toxicity criteria developed for mammals, birds, and fish would protect amphibians and reptiles, the permeable skin of amphibians and reptiles readily absorbs toxicants.

Eggs of amphibians, as well as larval stages and adults, would be subject to greater predation by fish because of fisheries development in alternatives A and B. Predatory fish may keep amphibians from important foraging habitat. Fish may also act as vectors for pathogens of amphibians.

Fish passage restoration in Pleasant Valley Creek, if determined feasible, may negatively impact amphibian populations (all alternatives).

Risk of habitat degradation and direct mortality of amphibians and reptiles may be increased in alternatives A and B, where traffic on existing roads may increase. Soil disturbance and increase in settling of airborne dust may affect water

temperature and sedimentation in aquatic habitats. As some amphibians undergo mass migrations to and from breeding habitats, they may be killed in mass while crossing roads. One study of frogs and toads (Fahrig et al. 1995) showed that the proportion of dead to live animals increased, and the total density of animals decreased, with increasing traffic intensity (Maxell and Hokit 1999).

Amphibians and reptiles would be at higher risk of mortality from handling and killing by humans in alternatives A and B, where public use and the development of recreational facilities along streams, lakes, and ponds would occur. These animals may become stressed by human handling. In addition, humans often transport animals, releasing them in unfamiliar or unfitting microhabitats, which can result in death to the animal.

Alternative B, where public use would be increased in critical amphibian habitat during spring and summer, would have a broader negative impact on amphibians and reptiles—through greater access to Dahl Lake and other wetlands, unrestricted access on designated trails and roads, increased access for fishing, and occurrence of nonmotorized floating devices on Dahl Lake. Risks associated with public use would be the least in alternative C.

Allowing fishing in alternative B, prior to restoration and recovery of native fish populations, may impact future recovery by depleting nursery stock or impacting the water's edge.

Adverse impacts on aquatic habitats of the refuge, affecting the fisheries food base, could occur from use of herbicides by neighboring landowners for control of invasive plants.

Cumulative Impacts

Traffic on the county road that runs through the refuge would multiply with increased public use under alternatives A and B, increasing disturbance to wildlife and the chance of wildlife–vehicle collisions.

SPECIES OF CONCERN—GRIZZLY BEAR, GRAY WOLF, CANADA LYNX

Estimated effects of the alternatives on the grizzly bear, gray wolf, and Canada lynx are described below.

Direct Impacts

Restoration and management of riparian areas and aspen communities in all alternatives would benefit grizzly bears and Canada lynx. Grizzly bears prefer riparian areas because they are rich in forage and provide more security than other cover types. At lower elevations, aspens become important emergency food for snowshoe hare, an important lynx food.

Alternatives A and C would promote refuge habitats as part of larger corridors for the grizzly bear and

gray wolf, allowing movement of individuals between distinct populations. Island populations cut off from one another by lack of suitable habitat are subject to high rates of extinction. Preserving linkages between populations may be more important to long-term conservation of a species than attempting to manage separate populations.

Deer and elk populations would be at levels to provide adequate prey for large predators, under all alternatives. Alternatives A and B would maintain adequate ground squirrel populations by prohibiting hunting. Ground squirrels are an important source of protein for grizzly bears and may also be taken by lynx and wolves.

Any grizzly bears would likely have access to early spring browse in all alternatives, because potential competition with livestock would not be a major factor. Livestock can affect grizzly bears through direct competition for early spring browse, by degradation of habitat from trampling and grazing, and displacement of bears from quality habitat as they avoid areas of human activity. In addition, there would be less likelihood of depredation of livestock by grizzlies.

Restoration of a free-ranging, nondepredating gray wolf pack would be facilitated in all alternatives, through removal of livestock, provision of abundant natural prey, and protection from disturbance.

Restrictions of public use while grizzly bears may occur on the refuge, in all alternatives, would reduce disturbance to and displacement of bears. Removal of carrion from roadsides would decrease the chance of scavenging grizzly bears and wolves being hit by cars. Alternative D would provide the most protection from disturbance for grizzlies, wolves, and Canada lynx due to little promotion of public use.

Public use restrictions in alternative B would protect gray wolves from disturbance at den and rendezvous sites. Since this alternative does not require public users to remain on designated trails or roads during winter, disturbance could occur to wolves while on deer and elk winter range.

Problem wolves would be controlled on surrounding federal, state, and private lands. Without wolf control in place, there would likely be more illegal killings of wolves than the present average of one per year (Interim Wolf Control Plan 1999).

Indirect Impacts

The maintenance or increase of deer and elk populations in alternative A would benefit grizzly bears, gray wolves, and Canada lynx, all of which feed on deer and elk.

Modification of the fences should have a positive impact on deer and elk populations in alternative A, which would increase native prey availability.

Conversely, predators use fences to help capture prey and creating fences that are more conducive to deer and elk movement may make the capture of prey more difficult.

In alternative A, the hunt program may be modified if it were found to be in conflict with restoration of these species. Alternatives B and C, which call for increased public use facilities (day use or campground facilities), would have increased potential for conflict with grizzly bears. Public use, including camping and hunting, may have periodic restrictions when grizzly bears or gray wolves are in the area, under alternative B. Although alternative D offers the most unrestricted access, public use would not be promoted, as it would be in alternatives A and B. The result is that there may not be as many people using the refuge, but they would be permitted wider access for a longer time.

Some effects of disturbance on the grizzly bear and gray wolf follow.

- Disturbance and displacement can result in reduced reproduction, higher mortality rates due to food stress or lower security, and smaller bear populations due to reduced carrying capacity.
- Bears habituated to humans often sustain mortality through greater vulnerability to hunters and poachers, collisions with motor vehicles (Claar et al. 1999), or becoming nuisance bears that must be controlled. Bears that habitually feed on human food and garbage often lose their normal wariness of people, become nuisance bears, and may become aggressive towards humans (Herrero 1985).
- Disturbance during wolf denning, around rendezvous sites, and in winter habitat has the potential to adversely affect the survival of wolves in the area.
- During wolf use of a den site, the pups are extremely vulnerable to disturbance that may keep the female away. The pups may be abandoned or exposed hazards such as inclement weather, predation, and physical barriers such as rivers. Rendezvous sites are safe areas where the adults leave the pups and return with food.

Restrictions during hunting seasons under alternative A would benefit the grizzly bear, gray wolf, and Canada lynx if they are located on or near the refuge. In addition, the restriction of coyote and black bear hunting in alternative A would benefit the grizzly bear and gray wolf. Wolves may be misidentified as coyotes or dogs and be killed by mistake. Grizzly bears can be confused with black bears. There would be some risk that grizzly bears and wolves would be shot intentionally by hunters who perceive them as threats to future hunting opportunities.

Wolves and lynx would not be subject to incidental injury or mortality from traps, as all alternatives restrict all trapping. These predators may both be caught in traps set for other species such as coyote, wolverine, or bobcat.

The presence of livestock at any time of the year that wolves are in the area may contribute to depredation or habituation of bears and wolves to livestock as a food source. Alternative C, which would not use grazing as a management tool, would benefit wolves and grizzly bears by decreasing competition between deer, elk, and livestock to increase survival and reproduction of these prey species. In the NCDE, livestock depredation was the most common reason for relocating grizzly bears. These relocations were significantly less successful than relocations for other offences. Wolf–livestock conflicts cause negative public perceptions of wolves, decreasing the acceptance of wolves by the public.

Environmental education, open communication, and development of trust between the public and managers under alternative A would ensure the success of recovery of the grizzly bear and gray wolf. Tolerance of wolves by the local public would reduce illegal killing, and allow opportunity for the public and biologists to investigate innovative ways to reduce wolf–livestock conflicts without killing wolves (such as aversive conditioning).

Cumulative Impacts

[None expected for all alternatives.]

SPECIES OF CONCERN—BALD EAGLE, TRUMPETER SWAN, BLACK TERN

Estimated effects of the alternatives on the bald eagle, trumpeter swan, and black tern are described below.

Direct Impacts

Restoration and management of riparian areas and aspen communities in alternative A would benefit bald eagles. Nesting habitat would be maintained near Dahl Lake in alternatives A and B. Aspen groves provide nest sites and roosting areas for bald eagles.

Alternative B would provide increased fish, an important food source for the bald eagle; however, sport fishing could increase disturbance to eagles and decrease the availability of fish. Increased numbers of waterfowl in alternatives A and B would provide an important source of food for bald eagles. Alternatives A and B would maintain adequate ground squirrel prey by prohibiting hunting.

In all alternatives, restrictions of public use near bald eagle nest sites would reduce disturbance to bald eagles. Removal of carrion from refuge roadsides would decrease the chance of scavenging

eagles being hit by cars. Alternative D would provide the most protection from disturbance for bald eagles due to little promotion of public use.

If waterfowl numbers increase as expected in alternatives B and D, additional prey would be available for eagles. High waterfowl numbers may result in a waterfowl hunting season under alternative B. This may affect bald eagles by increasing disturbance, causing accidental wounding of eagles by shot, and decreasing waterfowl numbers during hunting season.

Bald eagles would not be subject to incidental injury or mortality from traps, as all alternatives restrict trapping.

In alternative B, trumpeter swans would be protected through minimizing disturbance.

The black tern could be displaced from the Dahl Lake area as water levels would be slowly increased under alternative A, causing a short-term negative impact on shoreline vegetation.

Indirect Impacts

In alternatives A and D, restoration and improvement of habitat and reduction in grazing may have a negative effect on ground squirrel populations, with a subsequent decrease in bald eagle prey.

In alternative B, an interpretive display located within 0.5 mile of the eagle nest may affect production. For a blind to be effective, it must be located close to the bald eagle nest or perch trees, but use would be strictly regulated as to not jeopardize eagle recovery.

In all alternatives, the bald eagle, trumpeter swan, and black tern would benefit from water management that enhanced fisheries, and the subsequent availability of fish.

In alternative C, an educated public would be aware and accepting of management actions for bald eagles.

Cumulative Impacts

[None expected for all alternatives.]

SPECIES OF CONCERN—BOREAL TOAD, BULL TROUT

Estimated effects of the alternatives on the boreal toad and bull trout are described below.

Direct Impacts

Wetland restoration in alternative A would benefit boreal toads. These toads use the same sites for breeding year after year. They lay their eggs in shallow water where higher temperatures are found. Warm water is crucial to the development of their eggs.

Indirect Impacts

The removal of the water manipulation structures at Lower Moose Pond, as called for in alternative C, would adversely impact one of the largest reproductive sites for boreal toads in the Rocky Mountains. It is likely that this population of boreal toads would be eliminated. Research has shown that boreal toads have very limited dispersal (Olson 1992). They are also philopatric, i.e., laying their eggs in the same site every year.

Restoration of stream channels and riparian vegetation restoration on portions of the refuge (alternatives A, B, and C) would decrease water temperatures and improve water quality, to support the successful restoration of bull trout in the downstream Fisher River. Restoration of fish passage in Pleasant Valley Creek would benefit bull trout and other cold-water fishes.

If a viable sport fishery becomes established under alternatives A, B, or C, the refuge may be opened to fishing. In the case that bull trout also become established in refuge waters, the fishing program would be designed as to have minimal impact on bull trout.

Cumulative Impacts

[None expected for all alternatives.]

SPECIES OF CONCERN—SPALDING'S CATCHFLY

Estimated effects of the alternatives on Spalding's catchfly are described below.

Direct Impacts

Increased numbers of deer and elk in alternatives A and B has the potential to increase grazing and trampling of Spalding's catchfly plants.

In alternatives A and B, Spalding's catchfly (threatened plant) populations would be protected through identification of sites, protection of sites from trampling and grazing, control of invasive plants, and protection and restoration of native Palouse prairie. In addition, all suitable sites for Spalding's catchfly would be restored to up to 90 percent of available habitat in alternative C.

Alternative D would provide protection of catchfly populations found during inventory of suitable habitat prior to implementation of management actions. Catchfly populations would be further protected through control of invasive plants around known locations of the plants.

Public use may be restricted in uplands in alternatives A and B to reduce potential impacts. Any increase in public use of uplands, as may occur during hunting season, may have a negative impact on Spalding's catchfly recovery through unintentional trampling. Although the public has more off-trail access in alternative B than in

alternative A, the additional use either occurs in the bottomlands or during the winter so additional impact on Spalding's catchfly from trampling should not be a factor.

Alternative D may not have as many people using the refuge as in alternatives A or B, but they would be permitted wider access for a longer time period. There may be a threat to Spalding's catchfly from trampling by public users since the uplands would be open all year.

Conservation easements, obtained through coordination with partners, would protect habitat for Spalding's catchfly in alternatives A–C.

Indirect Impacts

Spalding's catchfly populations would likely increase in alternatives A and B. Catchfly habitat would be greatly benefited through decreased coverage of invasive plants, along with increased native grasses and forbs.

Prescribed burning of Palouse prairie (alternatives A and B) should have positive benefits for reinvigorating catchfly habitat. Removal of invasive plants would be conducted at least 2 years prior to prescribed burning to prevent seed production and dispersal (Goodwin 2001). Fire can have a positive impact on Spalding's catchfly by removing litter and duff and inhibiting the establishment of woody plants.

Healthy Palouse prairie, which benefits Spalding's catchfly, may be maintained by livestock grazing in alternatives A, B, and D. Grazing in these areas would be restricted to late fall or winter to protect plants from grazing and trampling.

Cumulative Impacts

With no use of fire under alternative D, Douglas-fir would encroach into the prairie grasslands and contribute to the gradual loss of that ecosystem essential for Spalding's catchfly. There would be increased woody shrubs in grasslands, which could have a cumulative impact with invasive plant encroachment by reducing the potential habitat for Spalding's catchfly, as well as outcompete current catchfly plants.

CULTURAL RESOURCES

Estimated effects of the alternatives on cultural resources are described below.

DIRECT IMPACTS

Cultural resources, including known and previously unknown resources, would be documented, protected, and maintained under all alternatives, as required by law. An educated and compliant public would not have adverse effects on cultural resources. Sensitive and fragile sites would be protected through

restricted access and law enforcement presence. Fundamental documentation, protection, and maintenance of sites and resources found on this new refuge may not be adequate where resources are diverted to restoration (alternatives B and C) or to a museum (alternative B).

In alternatives A–C, documenting as many sites as possible would allow planning of refuge projects to avoid or mitigate impacts to sites and objects.

The restoration of a cultural site (alternatives B and C) and development of a museum (alternative B) would be a source of information for researchers and scholars and provide for extensive interpretation and environmental education. Any historic buildings restored through this alternative could be used for refuge office space, housing, or the museum.

Maintaining resources to the extent they do not deteriorate would be difficult with refuge staffing for alternative D. This alternative would not adequately protect currently known or undocumented resources. Not only could this result in damage to the resource, but could increase costs as projects are delayed, changed, or stopped due to discovering previously-undocumented sites during a project.

There may be some damage to resources in alternative D, due to delays associated with reliance on off-site, qualified personnel to provide evaluation and documentation.

INDIRECT IMPACTS

In all alternatives, the presence of a cultural resource could impose restrictions on use of an area, including closures to public use, cessation of wetland restoration efforts, or modification in management projects. However, closures or restricted access to a site could allow for additional protection of sensitive, threatened, and endangered wildlife and plants. Conversely, closures or restrictions of access due to needs of sensitive, threatened, and endangered species would protect cultural resources in those areas.

Restoring Dahl Lake to its natural condition (as found during pre-European contact) would occur in alternatives A–C. This could have the effect of restoring the camas once found in this area and used by the Kootenai people (Wakefield 1998, Schwab et al. 2000). From another perspective, restoration of any aspect of the refuge to pre-European-contact conditions would eliminate historical traces of the homesteading era along the lake.

In alternatives A–C, documentation of cultural resources would provide opportunities to forge partnerships, which would furnish the expertise needed to do a thorough survey using up-to-date methods.

Increased access to sites would allow for more public education and interpretation in alternative B. While increasing support and compliance with rules and regulations to protect cultural resources, there would also be potential for increased disturbance and impacts.

CUMULATIVE IMPACTS

[None expected for all alternatives.]

PUBLIC USE

High-quality environmental education programs establish community support that will increase interest and understanding of the refuge and the Refuge System.

GENERAL PUBLIC USE

Estimated effects of the alternatives on general public use are described below.

Direct Impacts

Wildlife-dependent recreational uses can foster understanding and instill appreciation of native fish, wildlife, and plants as well as promote support for their restoration and conservation and support of the refuge as part of the Refuge System.

Restricting public use to designated trails would allow access to the public with minimal disturbance to wildlife in alternative C. Viewing opportunities may even improve as animals become habituated to predictable disturbance in a given area. Protection from disturbance, in conjunction with habitat restoration, should boost wildlife populations increasing public use opportunities.

Ethical wildlife viewing and photographic behavior, promoted in alternatives A–C, includes being considerate of other users and would reduce user conflicts.

Promoting a youth fishing program (alternatives A–C), even if provided off-refuge through partnerships, could provide support for management programs, as the public is made aware of current conditions and efforts to restore the natural water regime and native fisheries.

Indirect Impacts

All alternatives would support protection and conservation of natural resources and provide for better public use opportunities through development of a visitor services requirement evaluation and plan. Public use would be directed to those activities most compatible with resources.

Alternatives A and B would provide high-quality experiences—ones the public would want, use, and be attracted by; and which would complement opportunities provided by the private sector and other agencies.

Information gathered from a demographic survey would help plan refuge needs in hiring staff and developing facilities to support public use in alternatives A, B, and C. While saving much in the way of time and money by not conducting a demographic survey in alternative D, the refuge would not have basic information needed to provide the most appropriate public use that resources could support. This may contribute to resource damage by not anticipating how, where, and when visitors visit the refuge.

The introduction of trumpeter swans to Dahl Lake in alternative B may impact public uses such as hiking, bird watching, fishing, and hunting during reintroduction efforts.

Skilled staff would lead quality interpretive and environmental education programs in adequate facilities in alternatives A, B, and C. These resources would be available for other aspects of public use, e.g., contact station staffing and volunteer coordination.

Having refuge-specific environmental education materials available for classroom use may encourage students to visit and experience the refuge on their own, as provided in all alternatives. However, limited staff in alternative D would limit development and distribution of materials. The environmental education lessons would address ways to reduce and eliminate impacts to natural resources, thus protecting the refuge environment and increasing compliance to rules and regulations.

All alternatives would develop and maintain good relationships with refuge neighbors, as their children are exposed to environmental education programs, although this effort is extremely limited in alternative D.

Volunteer and partnership programs, to assist in all aspects of the public use and restoration programs, would flourish under alternative B, with increased partnerships facilitated by a volunteer coordinator. Limited staffing in alternative A would result in a smaller partnership and volunteer program.

Cumulative Impacts

[None expected for all alternatives.]

HUNTING

More details on the impacts of hunting can be found in the hunting EA, at <http://bisonrange.fws.gov/losttrail/lastea.pdf>

Estimated effects of the alternatives on hunting are described below.

Direct Impacts

Allowing hunting on portions of the refuge would allow for an expansion of hunting and provide quality opportunities.

Pulling staff from the National Bison Range to support the hunting program may limit other public use, although all could use hunting resources such as a good public use handout.

Indirect Impacts

Removal of some elk on the refuge would facilitate adequate harvest levels and assist MFWP in optimum management of the local elk population.

Restoration of wetlands and planting wild rice (alternative B) should increase the number of waterfowl using the refuge, which may lead to being able to open a quality waterfowl hunt.

[None for alternatives A, C, and D.]

Cumulative Impacts

[None for all alternatives.]

FISHING

Estimated effects of the alternatives on fishing are described below.

Direct Impacts

The natural water regimes and their corresponding fisheries and plant communities have been greatly modified in Pleasant Valley and do not support a quality fishing program at this time. A sport-fishing program at this time could hinder recovery and disturb habitat and other wildlife.

Alternatives A and B would provide the best possibility to establish a successful sport-fishing program. Since there is currently no viable fishery on the refuge, recovery and restoration must first be completed. If a sport fishery were established, access points and trails would be developed to direct anglers, including those with disabilities, to areas that would provide quality experiences and reasonable harvest opportunities. Partnerships would provide resources, personnel, and expertise in this effort. With restoration of natural water regimes and native fisheries, the refuge may provide a nursery for off-refuge fishing opportunities. Habitat would be provided for redband and westslope cutthroat trout.

While a native fish restoration program would be established in alternative C, even if fisheries were restored, fishing would not be allowed.

Fishing would be promoted to youth in alternatives A, B, and C. This would introduce future generations to the pleasure and excitement of fishing. Those involved would not only learn how to fish successfully, but ethically as well. In alternative C, more effort would be needed to find appropriate sites and partners to hold fishing events off-refuge. Supporting existing programs such as the MFWP's "Hooked on Fishing, Not on Drugs" would not only make them more successful, but could provide the

refuge a strong base to start its own on-site fishing program for youth if a sport fishery were restored.

Indirect Impacts

The wetland restoration program would have to be successfully completed before a fishery could be restored. The cost, personnel, and time needed to restore the fisheries may be large enough to make restoration to a level that could support a fishing program for alternatives A, B, and D within the time frame of this CCP (10–15 years) unrealistic or even prohibitive.

Support from partners in the watershed may be difficult to attain if sport fishing were never to be allowed under alternative C. Support for the program may be raised if, by restoring the hydrology on the refuge, downstream fisheries would be improved.

In alternative D, while a great deal of funding and staffing would be saved by not actively pursuing a native fish restoration program, the overall health of the refuge may suffer. Fish are an important part of the ecosystem, playing roles as predator and prey. Recovery of native fish should occur as the hydrology is restored in partnership with the NRCS, but could take a very long time. During this time, anglers as well as other wildlife-dependent recreation users such as wildlife photographers and bird watchers would not be able to experience aspects of a healthy stream ecology.

Cumulative Impacts

[None for all alternatives.]

WILDLIFE OBSERVATION AND PHOTOGRAPHY

Estimated effects of the alternatives on wildlife observation and photography are described below.

Direct Impacts

Visitors would have access to information about types of plants and animals on the refuge, as well as the best locations, times, and seasons to view them (alternatives A, B, and C). This would result in quality wildlife observation and photographic opportunities and experiences. Interpretive displays and handouts at viewing sites, as well as personal contacts, would inform users of opportunities and introduce them to the least disruptive ways to photograph and observe wildlife. With minimal staffing in alternative D, there would be limited personal contact with visitors. Information would need to be posted in accessible areas where it would be easily available to all.

In alternatives A–C, the refuge would offer a unique opportunity to observe and photograph Intermontane plants and animal in a native setting. The refuge would provide habitat for rarer species such as wolves, eagles, and bears, which are highly sought-after species for viewing and photography. Trails,

wildlife-viewing areas, and platforms would offer quality viewing opportunities and may increase chances of photographic success. Wildlife viewing and photographic opportunities would be limited in alternative D for those visitors who do not have the capability, or are reluctant, to travel off-trail and cross-country, reducing the quality of their experience.

Allowing visitors foot access to a large portion of the refuge in alternative B and the majority of the refuge in alternative D would provide opportunities for following and locating animals, however, this could cause wildlife to avoid areas easiest to access and reduce viewing and photographic opportunities.

Alternative B would allow access by permit to areas normally closed to the public, and could provide unique opportunities for wildlife observation and photography. Providing limited access to closed areas could expose the public to the need to protect and conserve natural resources, while limiting impacts to these areas. Adequate staff and office resources would result in a fair and equitable means to dispense permits.

Restoration of habitat and minimization of disturbance in alternative C should enhance public viewing opportunities by fostering wildlife populations. Access to most of the refuge would be restricted under this alternative, so opportunities for wildlife observation and photography would be limited. Limited access may make it difficult for the public to support resources with which they do not have direct contact. Outreach contacts would provide background for the closed areas.

Indirect Impacts

Wildlife photographers and bird watchers would be able to enjoy the aspects of a healthy stream ecology and receive quality, wildlife-dependent experiences, as a result of restoration of natural hydrology and associated fish, wildlife, and plants in alternatives A, B, and C.

Wetlands restoration in alternative B would increase numbers of water birds such as the black tern, American bittern, and grebes, along with mammals such as moose and mink. This would provide maximum wildlife viewing and photographic opportunities.

Wildlife photography and observation in alternatives A–C would foster appreciation for native fish, wildlife, and plants and their conservation, by providing the public with safe, quality, and compatible experiences.

Conflicts between users would be minimized in alternative A, by developing some areas for wildlife photography and observation that are away from other users. Visitors would be informed of where particular recreational uses may be taking place to give them choices.

The high levels of public use promoted in alternative B would provide facilities and opportunities that would benefit a variety of visitors, but user conflicts may also be increased. A recreational fee could help defray costs of implementing the permit program (for access to closed areas) in this alternative. The permit program, or any associated fee, may be disliked by visitors and result in less visitation.

Restricting wildlife viewers and photographers mainly to areas along roads in alternative C would concentrate users into a small area, with potential for conflicts with other recreationists and traffic. By restricting use to designated areas, not only can impacts to wildlife be minimized, but viewing and photographic opportunities may increase as animals habituate to human presence (Youmans 1999). Disturbance to the natural environment would be minimal, which may encourage wildlife to use the refuge and promote better viewing and photography of wildlife.

With limited information and facilities available for wildlife viewers and photographers in alternative D, conflicts with other users could increase. There would be no opportunity to instill ethical behavior under this alternative.

Cumulative Impacts

[None expected for all alternatives.]

INTERPRETATION

Interpretation would impart the unique stories of the refuge—wetland restoration; restoration of native plants, fish, and wildlife; threatened and endangered species; Native American inhabitants, homesteaders, and the railroad.

Interpretive materials and activities would help users develop appropriate expectations and make informed choices about recreational opportunities available at the refuge. This would result in quality experiences and minimal resource impacts. Estimated effects of the alternatives on interpretation are described below.

Direct Impacts

Interpretive activities would tie together public use with the biology, management, and rules of the refuge, in alternatives A–C. Interpretation would foster understanding and instill appreciation for fish, wildlife, and plants and their conservation. Support of the refuge as part of the Refuge System would be promoted. Alternative A would provide a balance between personal contact (large funding and staffing needs) with less expensive and timesaving self-guided services.

All alternatives would provide some level of self-guided services (brochures, exhibits, kiosks, and audiovisual media). While these can have high, initial costs, subsequent maintenance and staffing would be

minimal. This form of interpretation does not appeal to all users. The different alternatives provide varying levels of personal contact with refuge visitors.

An increase in personal interpretive services in alternative B should increase understanding of and compliance with rules and regulations, to reduce resource impacts in this high public use alternative.

Development of the contact station in all alternatives would provide support to visitors, especially during peak public use times such as weekends, spring bird watching, summer vacation, and fall hunting season. Partnerships and volunteer programs would be developed to assist with the interpretive program. Alternative B would provide for contacting more visitors, due to the station being open more hours (7 days per week). There would be less chance for personal contact with visitors in alternative D, because the contact station would be open limited hours.

Alternative B would provide guided walks and talks that would attract visitors to the refuge, especially those coming for the first time and in need of orientation. By providing variety and different skill levels, the refuge would promote return users.

Under alternative C, much of the refuge would be closed to public use and restrictions would apply to most areas. Visitors would be informed of the reasoning and rationale behind this management decision to encourage compliance. Interpretive messages would emphasize that even nonconsumptive recreational uses such as observation and photography cause wildlife disturbance and alter behavior.

Alternative D would have no cohesive interpretive program. This may reduce the time spent at the refuge as well as reduce the quality of visitor experiences.

Indirect Impacts

Alternative C would provide little opportunity for direct public experience with, or interpretation of, the refuge's natural resources.

Limited access to the contact station in alternative D would reduce the availability of getting needed information (safety, rules, and regulations) to visitors. This could correspond to an increase in conflicts between users, noncompliance of rules, and damage to natural resources.

Cumulative Impacts

[None expected for all alternatives.]

ENVIRONMENTAL EDUCATION

Estimated effects of the alternatives on environmental education are described below.

Direct Impacts

Environmental education programs would promote understanding and appreciation of natural and cultural resources. Children that are resident of the Pleasant Valley would be able to further their appreciation for the surrounding environment. In addition, community support could be established, which would increase interest and understanding of the refuge as part of the Refuge System.

Alternative A would provide a good, basic environmental education program (appendix A) to build on as future needs demand. The program would complement what is currently being offered by Glacier Institute, MFWP, and Flathead Valley Community College.

Since the local schools (Marion, Pleasant Valley, Lost Prairie, and Montana Academy) are small (Pleasant Valley School had five students at the start of the 2001–2002 school year), the program should reach to at least Kalispell and Libby, especially for use of the lending library (all alternatives). The lending library would be a very effective means of spreading the environmental education message to schools who find the distance to the refuge a deterrent.

The environmental education site developed in alternatives A and B would involve underserved populations such as urban or rural schools, Native Americans, non-English speaking populations, senior citizens, people with disabilities, and colleges and universities. This type of environmental education would be tied to pre- and postsite activities to prepare students for the experience and to reinforce messages.

Alternatives A, B, and C would provide an extensive environmental education program (appendix A). Because of the large distance to most schools, day trips may not be feasible for the majority of educational facilities. Overnight facilities would be developed. Benefits would include attracting school groups from a wide area, opportunities for long-term contact and interaction, and the availability of students and educators to help with monitoring, research, and restoration efforts.

With staff and facilities being extremely limited in alternative D, the refuge would only be able to accommodate a few requests from schools for environmental education services. Opportunities for pre- and postfield trip programs would be limited, which could limit the effectiveness of field trips.

Indirect Impacts

Partnerships could be critical in providing funding, materials, staff, and volunteers to develop and provide basic environmental education program in alternative A.

The extensive environmental education program in alternative B would promote stewardship in youth, who are our future caretakers.

Alternative C's environmental education program would help foster stewardship among our future caretakers, however, it would be hard to inspire appreciation and establish ties to natural resources if students do not get to experience the resources on-site.

Cumulative Impacts

[None for all alternatives.]

SOCIOECONOMICS

None of the alternatives considered is expected to have disproportionately high adverse impacts to the health of any human beings (especially to Native American tribal members, and minority or low-income populations) or to the environment.

While the refuge is located near Native American tribal lands, the refuge is not within the boundaries of any Indian reservation. The local area is not comprised of either a predominantly minority population nor a predominantly low-income population. Estimated effects of the alternatives on the socioeconomic situation are described below.

DIRECT IMPACTS

For all alternatives, it is estimated that employment of refuge staff would have a positive effect on local employment, income, and housing conditions in the communities surrounding the refuge or in the Kalispell area. It is not expected that implementation of any alternative would result in increased housing construction in the area of the refuge.

Projected staffing levels for the alternatives range between seven full-time employees in alternative A to one full-time and one part-time employee in alternative D. Staffing income is estimated to range from \$390,000 in alternative A to \$98,000 in alternative D. Additionally, temporary jobs and indirect employment could be generated during annual work and maintenance as well as one-time projects.

Volunteer and youth programs would provide opportunities for people to gain job experiences in a wide variety of natural resource management and visitor services, which could provide for better future job opportunities.

INDIRECT IMPACTS

The open, rural, visual character of the refuge in all the alternatives considered, against the backdrop of the Rocky Mountains, would benefit adjacent landowners and nearby communities.

All alternatives would have, in the long term, a positive impact on public perception of refuge programs, particularly by the local ranchers and timber industry personnel. While it is believed that current public perception is dominated by the refuge's history of ranching, future perceptions may associate the refuge as restored, ecologically sound wildlife habitat and a valuable part of the Refuge System. Such a change would benefit the refuge and the surrounding communities.

Securing additional water rights related to the Meadow Creek restoration (all alternatives) would be done through the state court system. The Service expects that the issue of expanding the refuge's water rights would have a neutral effect on socioeconomic conditions in the area. Past water rights' adjudications and water issues generated few conflicts for the previous owners of Lost Trail Ranch.

Any of the alternatives would help to restore refuge habitat as a place where the gray wolf and grizzly bear could meet all or most of their life cycle needs. If these species were once again to make the refuge part of their home range, there could be beneficial effects on the local tourism industry.

Wolves and grizzlies are not only a source of wonderment to wildlife enthusiasts, but also a source of concern for some landowners near the refuge, especially those whose livelihood is intrinsically tied to domestic cattle and sheep ranching. Even with implementation of protective measures including a livestock compensation program, there may be deleterious effects on the local public's perceptions,

as well as on their support for, the existence and management of the refuge.

CUMULATIVE IMPACTS

While meeting refuge goals through any of the alternatives may make development of adjacent lands more attractive, it would not directly affect any land use, employment, or income conditions outside the refuge.

PARTNERSHIPS

Existing partnerships would be maintained and new partnerships would be fostered to meet refuge purposes, in all alternatives. In alternatives A, B, and C, additional partnerships would provide volunteers to assist with habitat management projects.

For example, the mission of the MCC is to bring together Montana's commitment to its people and its natural resources—by enhancing citizenship and employability through stewardship of our lands and community service.

Their model is “young people + hard work + meaningful projects = quality citizens and a better environment.”

In partnership with MCC, the refuge would help fulfill the MCC mission along with refuge objectives through community service projects that provide habitat benefits. High-priority refuge projects such as removal of fencing and facility maintenance would be accomplished.

Glossary

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

adaptive 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 refuge research and monitoring and evaluation of management actions, to support or modify objectives and strategies at all planning levels.

alternatives—different sets of objectives and strategies or means of achieving refuge purposes and goals, helping fulfill the Refuge System mission and resolving issues.

amphibians—a class of cold-blooded vertebrates including frogs, toads, and salamanders.

APHIS—Animal and Plant Health Inspection Service.

ARPA—Archaeological Resources Protection Act.

ATV—all-terrain vehicle.

bald eagle disturbance—any human-elicited response that induces a behavioral or physiological change in a bald eagle contradictory to those that facilitate survival and reproduction. Disturbance may include elevated heart or respiratory rate, flushing from a perch or events that cause a bald eagle to avoid an area or nest site. (MBEWG 1994)

bald eagle nest—any platform within the breeding area that may have been built or used by a bald eagle, usually as a focus for reproductive behavior and activity. Bald eagle nests are usually built by mated pairs, are made of sticks, and are situated in trees. Nests may be constructed by single eagles or other species and composed exclusively or in part of grass, forbs, or human-constructed material and situated on cliffs, structures (windmills, utility poles), or the ground. (MBEWG 1994)

bald eagle nest site management zone—local geographic areas surrounding active and alternate bald eagle nests in which human activities are likely to disrupt normal breeding activity. Zones involve application of spatial and temporal human activity restrictions, progressively less restrictive with increasing distance from the nest site. (MBEWG 1994)

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

big game—large animals sought for hunting or fishing for sport including white-tailed deer, pronghorn, mule deer, elk, moose, bighorn sheep, black bear, and mountain lion.

biological control, *also* **biocontrol**—reduction in numbers or elimination of unwanted species by the introduction of natural predators, parasites, or diseases.

biological integrity—composition, structure, and function at the genetic, organism, and community levels consistent with natural conditions and the biological processes that shape genomes, organisms, and communities.

biomass—the total amount of living material, plants and animals, above and below the ground in a particular habitat or area.

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

Bonneville Power Administration (BPA)—a federal agency under the U.S. Department of Energy that markets wholesale electrical power and operates and markets transmission services in the Pacific Northwest. The power comes from 31 federal hydro-projects, 1 nonfederal nuclear plant, and several other nonfederal power plants. The hydro-projects and the electrical system are known as the Federal Columbia River Power System. (<http://www.bpa.gov/corporate/kc/home/facts/>).

BPA—*see* Bonneville Power Administration.

Breeding Bird Survey—a cooperative program of the U.S. Fish and Wildlife Service and the Canadian Wildlife Service for monitoring population changes in North American breeding birds by using point counts along roads (Koford et al. 1994).

Cabinet/Yaak ecosystem (CYE)—encompasses about 2,720 square miles of northwestern Montana and northern Idaho. The Cabinet Mountains comprise about 58 percent of the ecosystem and lie south of the Kootenai River, with the Yaak River to the north. Two 7.2-mile-wide corridors link the Yaak with the Cabinet Mountains. (<http://www.r6.fws.gov/endspp/grizzly/cabyaakprogrept2002.pdf>)

CCP—*see* comprehensive conservation plan.

CFR—Code of Federal Regulations.

CFS—cubic feet per second.

climax—a community that has reached a steady state under a particular set of environmental conditions; a relatively stable plant community; the final stage in ecological succession.

cm—centimeter; equivalent to 0.39 inch.

colony—the nests or breeding place of a group of birds (such as herons) occupying a limited area.

compatibility—a wildlife-dependent recreational use or any other use of a refuge that, in the sound professional judgment of the refuge manager, will not materially interfere with or detract from the fulfillment of the mission of the Refuge System or the purposes of the refuge (Draft USFWS Manual 603 FW 3.6). A compatibility determination supports the selection of compatible uses and identified stipulations of limits necessary to ensure compatibility. A use (recreational or nonrecreational) of a refuge is incompatible if, in the sound professional judgment of the director of the Service, it will materially interfere with or detract from the fulfillment of the mission of the Refuge System or the purposes of the refuge. Incompatible uses are not allowed to occur on Service areas.

comprehensive conservation plan (CCP)—a document that describes the desired future conditions of the refuge. Provides long-range (15-year) guidance and management direction for the refuge manager to accomplish the purposes of the refuge, contribute to the mission of the Refuge System, maintain and, where appropriate, restore the biological integrity, diversity, and environmental health of each refuge and the Refuge System, and meet other mandates. (602 FW 3). For refuges established after October 8, 1997, CCPs are prepared when the refuge obtains staff and acquires a land base sufficient to achieve refuge purposes, but no later than 15 years after establishment of the refuge. Refuges convert long-range management plans (e.g., master plans and refuge management plans) approved prior to October 9, 1997 into CCPs with appropriate public involvement and NEPA compliance, no later than October 2012.

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 (65–85° F). Examples of cool-season grasses at refuge are bluebunch wheatgrass, Idaho fescue, and rough fescue.

coordination area—a wildlife management area made available to a state, by “(A) cooperative agreement between the United States Fish and Wildlife Service and the state fish and game agency pursuant to Section 4 of the Fish and Wildlife Coordination Act (16 U.S.C. 664); of (B) by long-term leases or agreements pursuant to the Bankhead–Jones Farm Tenant Act (50 Stat. 525; 7 U.S.C. 1010 et seq.)” States manage coordination

areas, but they are part of the Refuge System. CCPs are not required for coordination areas.

CSKT—Confederated Salish and Kootenai Tribes.

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

cultural resource inventory—a professionally conducted study designed to locate and evaluate evidence of cultural resources present within a defined area. Inventories may involve various levels including background literature search (class I), sample inventory of project site distribution and density over a larger area (class II), or comprehensive field examination to identify all exposed physical manifestation of cultural resources (class III).

CYE—*see* Cabinet/Yaak ecosystem.

defoliation—the removing of vegetative parts; to strip vegetation of leaves; removal can be caused by weather, mechanical, animals, and fire.

depredation—damage inflicted on agricultural crops or ornamental plants by wildlife. Depredation can also refer to the taking of wildlife, including destruction of nests or dens, and eggs or young.

depredation by wolves—killing or serious maiming by one or wolves of lawfully present domestic livestock or other domestic animals on federally and state-managed lands or private lands, accompanied by the threat that additional livestock or domestic animals will be killed or maimed by wolves.

dm—decimeter; equivalent to 3.94 inches.

DNRC—Montana Department of Natural Resources and Conservation.

DOI—Department of the Interior.

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.

ecological diversity—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 (USFWS Manual 052 FW 1.12B).

ecosystem—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.

EE—environmental education.

EIS—environmental impact statement.

emergent—a plant rooted in shallow water and having most of the vegetative growth above water. Examples are cattail and hardstem bulrush.

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

endangered species, state—a plant or animal species listed under the federal Endangered Species Act that is located in Montana. See listings at: <http://www.fwp.state.mt.us/wildthings/t%26e.asp>

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 the need for an action, alternative to such action. An EA provides sufficient evidence and analysis of impacts to determine whether to prepare an environmental impact statement or finding of no significant impact (40 CFR 4508.9).

environmental health—natural composition, structure, and functioning of the physical, chemical, and other abiotic elements, and the abiotic processes that shape the physical environment.

ESA—Endangered Species Act.

EVS—education and visitor services.

extinction—the complete disappearance of a species from the earth; no longer existing (Koford et al. 1994).

extirpate—the elimination of a species from an island, local area, or region (Koford et al. 1994); to destroy completely; wipe out.

fauna—all the vertebrate and invertebrate animals of an area; the animals' characteristic of a region, period, or special environment.

fen, also alkaline bog—wetland primarily composed of organic soil material (peat or muck) that took thousands of years to develop.

FERC—Federal Energy Regulatory Commission.

finding of no significant impact (FONSI)—a document prepared in compliance with the National Environmental Policy Act, supported by an environmental assessment, that briefly presents why a federal action will have no significant effects on the human environment and for which an environmental impact statement will not be prepared (40 CFR 1508.13).

fire regime—a description of the frequency, severity, and extent of fire that typically occurs in an area or vegetative type.

flora—all the plant species of an area; plant or bacterial life characteristic of a region, period, or special environment.

FONSI—*see* finding of no significant impact.

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.

forest—a group of trees with their crown overlapping (generally forming 60–100 percent cover).

“friends group”—any formal organization whose mission is to support the goals and purposes of its associated refuge and the National Wildlife Refuge System. This includes “friends” organizations and cooperating and interpretive associations.

FTE—full-time equivalent employee.

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 (i.e., points, lines and polygons) with nongeographic attributes such as species and age (Koford et al. 1994).

GIS—*see* geographic information system.

global positioning system (GPS)—a system that, by using satellite telemetry, can pinpoint exact locations of places on the ground.

goal—descriptive, open-ended, and often broad statements of desired future conditions that convey a purpose but do not define measurable units (Draft USFWS Manual 620 FW 1.5).

GPS—*see* global positioning system.

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

GYA—Greater Yellowstone Area.

habitat—the place or environment where a plant or animal naturally or normally lives and grows.

habitat development plan—a dynamic working document that provides refuge managers a decision-making process; guidance for the management of refuge habitat; and long-term vision, continuity, and consistency for habitat management on refuge lands. Each plan incorporates the role of refuge habitat in international, national, regional, tribal, state, ecosystem, and refuge goals and objectives; guides analysis and selection of specific habitat management strategies to achieve those habitat goals and objectives; and uses key data, scientific literature, expert opinion, and staff expertise. (USFWS Manual 620 FW 1)

habitat fragmentation—the alteration of a large habitat, creating isolated patches of the original habitat that are interspersed with a variety of other habitat types (Koford et al. 1994); the process of reducing the size and connectivity of habitat patches, making movement of individuals or genetic information between parcels difficult or impossible.

herbivore—an animal feeding on plants.

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.

indicator species—a species of plant or animal that is assumed to be sensitive to habitat changes and represents the needs of a larger group of species.

integrated pest management (IPM)—the control of pest species (plant or animal) using a practical, economical, and scientifically based combination of biological, mechanical, cultural, or chemical control methods. A balanced approach to controlling pest species' populations.

intermittently flooded—substrate usually exposed, but surface water is present for variable periods without seasonal periodicity.

introduced species—a species present in an area due to deliberate release by humans (including reintroductions, transplants, and restocked species) or due to accidental release through escape or indirect assistance (Koford et al. 1994).

introduction—the intentional or unintentional escape, release, dissemination, or placement of a species into an ecosystem as a result of human activity.

invasive species—a species that is nonnative to the ecosystem; a species whose introduction causes or is likely to cause environmental or economic harm, or harm to human health.

involute sanctuary—a place of refuge or protection where animals and birds may not be hunted.

IPM—*see* integrated pest management.

issue—any unsettled matter that requires a management decision, e.g., an initiative, opportunity, resource management problem, threat to the resources of the unit, conflict in uses, public concern, or the presence of an undesirable resource condition.

lawfully present livestock—livestock (cattle, sheep, horses, and mules) occurring on private lands or on legal allotments (not trespassing) on federal lands.

Lincoln County tansy ragwort management program—an invasive plant grant program in conjunction with the Montana Department of Agriculture that has a continued focus on containment, control, and eradication of tansy ragwort infestations. Techniques include revegetation of disturbed logging sites, mapping infestations, spot treatment with herbicides, and continued release of biocontrol agents (Montana Department of Natural Resources Biennial Noxious Weed Summary Report FY 01–02).

MAAQS—Montana ambient air quality standards.

maintenance management system (MMS)—a national database that contains the unfunded maintenance needs of each refuge. Projects include those required to maintain existing equipment and buildings and to correct safety deficiencies for the implementation of approved plans, and to meet goals, objectives, and legal mandates.

MBEWG—Montana Bald Eagle Working Group.

MCC—Montana Conservation Corps.

mechanical control—reduction in numbers or elimination of unwanted species through the use of mechanical equipment such as mowers and clippers.

mesic—characterized by, relating to, or requiring a moderate amount of moisture; having a moderate rainfall.

MFWP—Montana Department of Fish, Wildlife and Parks.

migration—regular extensive, seasonal movements of birds between their breeding regions and their wintering regions (Koford et al. 1994); to pass, usually periodically, from one region or climate to another for feeding or breeding.

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

mitigation—measures designed to counteract environmental impacts or to make impacts less severe.

mixed-grass prairie—the transition zone between the tall-grass prairie and the short-grass prairie dominated by grasses of medium height that are approximately 2–4 feet tall. Soils are not as rich as the tall-grass prairie and moisture levels are less.

mm—millimeter; equivalent to 0.04 inch.

MMS—*see* maintenance management system.

MNHP—Montana Natural Heritage Program.

monitoring—the process of collection information to track changes of selected parameters over time.

MOU—memorandum of understanding.

MOYOCO—Upper Missouri, Yellowstone, Upper Columbia River ecosystem.

MPC—Montana Power Company.

MPIF—Montana Partners in Flight.

NAAQS—national ambient air quality standards.

National Bison Range complex—National Wildlife Refuge System land and programs including: National Bison Range, Ninepipe National Wildlife Refuge (NWR), Pablo NWR, Swan River NWR, Lost Trail NWR, and Northwest Montana Wetland Management District (includes 15 waterfowl production areas, as well as a conservation easement program).

national wildlife refuge (NWR)—“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.” Find a complete listing of all units of the Refuge System in the current “Annual Report of Lands Under Control of the U.S. Fish and Wildlife Service.”

National Wildlife Refuge System (Refuge System, NWRS)—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 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, or waterfowl production areas.

National Wildlife Refuge System mission—“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.”

native species—species that are part of the original plant and animals of an area. In general, meaning from the same continent (Johnson and Larson 1999).

NCDE—*see* northern Continental Divide ecosystem.

NCTC—National Conservation Training Center.

Neotropical migratory bird—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 hatch successfully (one or more eggs hatch) of the total number of nests initiated in an area.

NGO—*see* nongovernmental organization.

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

North American Waterfowl Management Plan—the North American Waterfowl Management Plan, signed in 1986, recognizes that the recovery and perpetuation of waterfowl populations depends on restoring wetlands and associated ecosystems throughout the United States and Canada. It established cooperative international efforts and joint ventures composed of individuals; corporations; conservation organizations; and local, state, provincial, and federal agencies drawn together by common conservation objectives. Lost Trail National Wildlife Refuge falls into the “Prairie Pothole Joint Venture.”

northern Continental Divide ecosystem (NCDE)—this is 32,300 square kilometers (8 million acres) of extremely diverse habitats, much of it being heavily forested, mountainous, and a largely roadless wilderness along the Rocky Mountains from the Canadian border south to Lincoln, Montana. (http://www.nrmssc.usgs.gov/research/NCDEbear_dna_detail.htm)

Northern Rocky Mountain Wolf Recovery Plan—a document prepared by a team of individuals with expertise regarding the biological and habitat requirements of the wolf, outlining the tasks and actions necessary to recover the species within parts of its former range in the Rocky Mountain region. Original plan completed in 1980. Revised recovery plan approved August, 3 1987.

NRCS—Natural Resources Conservation Service.

NTMB—*see* Neotropical migratory bird.

NVCS—national vegetation classification standards.

NWI—national wetland inventory.

NWR—*see* national wildlife refuge.

NWRS—*see* National Wildlife Refuge System.

objective—a concise statement of what is to be achieved, when and where it is to be achieved, and who is responsible for the work. Objectives are derived from goals and provide the basis for determining management strategies. Objectives should be attainable, time-specific, and measurable.

Partners in Flight (PIF)—a Western Hemisphere program designed to conserve Neotropical migratory birds and officially endorsed by numerous federal and state agencies and nongovernmental organizations; also known as the Neotropical Migratory Bird Conservation Program (Koford et al. 1994).

PCTC—Plum Creek Timber Company.

perennial—plants that live for 3 years or more (Johnson and Larson 1999).

permanently flooded—surface water is present throughout the year in all years.

PIF—*see* Partners in Flight.

planning team—teams that are interdisciplinary in membership and function. Teams generally consist of a planning team leader; refuge manager and staff biologists; a state natural resource agency representative; and other appropriate program specialists (e.g., social scientist, ecologist, recreation specialist). Other federal and tribal natural resource agencies are asked to provide team members, as appropriate. The planning team prepares the comprehensive conservation plan and appropriate National Environmental Policy Act documentation.

planning team leader—typically a professional planner or natural resource specialist knowledgeable of the requirements of National Environmental Policy Act and who has planning experience. The planning team leader manages the refuge planning process and ensures compliance with applicable regulatory and policy requirements.

planning unit—a single refuge, an ecologically or administratively related refuge complex, or distinct unit of a refuge. The planning unit also may include lands currently outside refuge boundaries.

Pleasant Valley ecosystem—the plants, wildlife, and associated life cycles associated with the land area of the Pleasant Valley watershed.

Pleasant Valley watershed—land area drained by water (rivers, stream, lakes) that flows into the water sources located in Pleasant Valley and its major water sources (Dahl and Lynch lakes, and Pleasant Valley Creek) ending at the confluence of the Pleasant Valley–Fisher River.

predation—a mode of life in which food is primarily obtained by the killing or consuming of animals.

prescribed fire—controlled application of fire to the landscape that allows the fire to be confined to a predetermined area while producing the intensity of heat and rate of spread required to achieve planned management objectives.

priority public uses—six wildlife-dependent recreational public uses authorized by the Improvement Act to have priority and are found to be appropriate for refuges. They are hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation. Compatibility of these uses needs to be determined for each refuge.

problem wolves—wolves that have depredated on lawfully present livestock, domestic animals (pets), or other member of a group; pack of wolves including adults, yearlings, and young-of-the-year that were directly involved in the depredation, or fed upon the remains, of livestock that were a result of the depredation.

proposed action—the alternative proposed by the Service as best achieving the refuge purpose, vision, and goals; contributing to the Refuge System mission and addressing the significant issues; and consistent with principles of sound fish and wildlife management.

purposes of the refuge—“The purposes specified in or derived from the law, proclamation, executive order, agreement, public land order, donation document, or administrative memorandum establishing, authorizing, or expanding a refuge, refuge unit, or refuge subunit.”

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

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

resident species—a species inhabiting a given locality throughout the year; nonmigratory species. Examples for Lost Trail National Wildlife Refuge include Columbian ground squirrel, black-capped chickadee, great horned owl, moose, and coyote.

richness, *also* species richness—the absolute number of species in an assemblage or community; the number of species in a given area (Koford et al. 1994).

riparian area *or* zone—the area adjacent to water; the area influenced by water associated with streams or rivers.

RMEF—Rocky Mountain Elk Foundation.

RMP—Rocky Mountain population.

RONS—*see* refuge operating needs 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, or glaciers.

semipermanently flooded—surface water is present throughout the growing season in most years.

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

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

SHPO—state historic preservation office.

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

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 Code of Federal Regulations or other public regulations (Refuge Manual 5 RM 17.6).

species of concern, federal—species that (1) are documented or have apparent population declines; (2) are small or restricted populations; or (3) depend on restricted or vulnerable habitats.

step-down management plan—step-down management plans provide the details (strategies and implementation schedules) necessary to meet goals and objectives identified in the comprehensive conservation plan (CCP). CCPs will either incorporate or identify step-down plans required to carry out the CCP. After completion of the CCP, existing step-down plans will be modified as needed to accomplish stated goals and objectives. (602 FW 4).

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

tansy ragwort—*Senecio jacobaea* is an Eurasian invasive plant in the sunflower family (Asteraceae). It spreads primarily by seed—a single tansy ragwort plant may produce up to 150,000 seeds, which may remain viable for up to 15 years. All parts of this plant are poisonous. It causes liver damage to cattle and horses, while sheep are affected to a lesser extent. (<http://www.oneplan.org/index.htm>)

temporarily flooded—surface water is present for brief periods during the growing season.

THPO—tribal historical preservation office.

threatened species, federal—species listed under the Endangered Species Act 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 listed under the federal Endangered Species Act that is located in Montana. See listings at <http://www.fwp.state.mt.us/wildthings/t%26e.asp>

USDA—U.S. Department of Agriculture.

U.S. Fish and Wildlife Service (Service, USFWS)—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 540 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.

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

USFW—*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 what the planning unit should be, or what the Service hopes to do, based primarily on the Refuge System mission, specific refuge purposes, and other mandates. In addition, the vision statement is tied to the maintenance and restoration of biological integrity, diversity, and environmental health of each refuge and the Refuge System.

visual obstruction reading (VOR)—a measurement of the density of a plant community; the height of vegetation that blocks the view of predators to a nest.

VOR—*see* visual obstruction reading.

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

warm-season grasses—grasses that begin growth later in the season (early June). These grasses require warmer soil temperatures to germinate and actively grow when temperatures range from approximately 85 to 95 degrees F. Examples of warm-season grasses are red threeawn

(*Aristida longisetata*) and mountain brome (*Bromus carinatus*).

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

waterfowl production area (WPA)—prairie wetland with associated upland that is managed to provide nesting areas for waterfowl, which is owned in fee title by the Service. These lands are purchased from willing sellers with funds from Duck Stamp sales. They are open to public hunting, fishing, and trapping according to state and federal regulations.

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

wetland easement—a perpetual agreement entered into by a landowner and the Service. The easement covers only the wetlands specified in the agreement. In return for a single lump-sum payment, the landowner agrees not to drain, burn, level, or fill wetlands covered by the easement.

wetland management district (WMD)—land that the Refuge System acquires (with federal Duck Stamp funds), restores, and manages primarily as prairie wetland habitat critical to waterfowl and other wetland birds. The National Bison Range WMD includes 15 waterfowl production areas and an easement program located in Flathead and Lake counties.

wetland reserve program (WRP)—voluntary program offering landowners the opportunity to protect, restore, and enhance wetlands on their property. The Natural Resources Conservation Service provides technical and financial support to help landowners with their wetland restoration efforts. The NRCS goal is to achieve the greatest wetland functions and values, along with optimum wildlife habitat, on every acre enrolled in the program. This program offers landowners an opportunity to establish long-term conservation and wildlife practices and protection. (<http://www.nrcs.usda.gov/programs/wrp/>)

wildlife-dependent recreational use—“A use of a refuge involving hunting, fishing, wildlife observation and photography, or environmental education and interpretation.” These are the six priority public uses of the Refuge System as established in the National Wildlife Refuge System Administration Act, as amended. Wildlife-dependent recreational uses, other than the six priority public uses, are those that depend on the presence of wildlife. Other uses will be considered in the preparation of a comprehensive conservation plan; however, the six priority public uses always will take precedence.

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

WMD—*see* wetland management district.

wolf den—a place where wolves rear their pups, usually for the first six weeks. Dens are often used year after year, but wolves may also dig new dens or use some other type of shelter, such as a cave.

wolf pack—a group of wolves, usually consisting of a male, a female, and their offspring.

wolf recovery team—a designated group working on the recovery of wolves to an area in compliance with the Endangered Species Act.

wolf rendezvous site—a place where wolves gather after the young have left the den site.

woodland—open stands of trees with crowns not usually touching (generally forming 25–60 percent cover).

WPA—*see* waterfowl production area.

WRP—*see* wetland reserve program.



Appendices

Appendix A—Background Information

This appendix includes background information related to the refuge and its management, as follows:

- key legislation and policy
- refuge establishment history
- public use
- water rights
- species of concern
- cultural resources

KEY LEGISLATION AND POLICY

Americans with Disabilities Act (1992): Prohibits discrimination in public accommodations and services.

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 for major wetland modifications.

Criminal Code of Provisions of 1940, as amended, (18 U.S.C. 41): States the intent of Congress to protect all wildlife within federal sanctuaries, refuges, fish hatcheries, and breeding grounds. Provides that anyone (except in compliance with rules and regulations promulgated by authority of law) who hunts, traps, or willfully disturbs any such wildlife, or willfully injures, molests, or destroys any property of the United States on such land or water, shall be fined up to \$500 or imprisoned for not more than 6 months or both.

Emergency Wetland Resources Act of 1986: Authorizes the purchase of wetlands from Land and Water Conservation Fund moneys, removing a prior prohibition on such acquisitions. The Act also requires the Secretary to establish a national wetlands priority conservation plan, requires the states to include wetlands in their comprehensive outdoor recreation plans, and transfers to the Migratory Bird Conservation Fund amount equal to import duties on arms and ammunition.

Endangered Species Act of 1973 and recent amendments (16 U.S.C. 1531–1543; 87 Stat. 884), as amended (establishing legislation): Provides for conservation of threatened and endangered species of fish, wildlife, and plants by federal action and by encouraging state programs. Specific provisions include:

- the listing and determination of critical habitat for endangered and threatened species and consultation with the Service on any federally funded or licensed project that could affect any of these agencies;
- prohibition of unauthorized taking, possession, sale, transport, etc., of endangered species;
- an expanded program of habitat acquisition;
- establishment of cooperative agreements and grants-in-aid to states that establish and maintain an active, adequate program for endangered and threatened species;
- assessment of civil and criminal penalties for violating the Act or regulations.

Environmental Education Act of 1990 (20 U.S.C. 5501–5510; 104 Stat. 3325): Public Law 101-619, signed November 16, 1990, established the Office of Environmental Education within the U.S. Environmental Protection Agency (EPA) to develop and administer a federal environmental education program. Responsibilities of the office include developing and supporting programs to improve understanding of the natural and developed environment, and the relationships between humans and their environment; supporting the dissemination of educational materials; developing and supporting training programs and environmental education seminars; managing a federal grant program; and administering an environmental internship and fellowship program. The office is required to develop and support environmental programs in consultation with other federal natural resource management agencies, including the Service.

Executive Order 11988—Floodplain Management: This executive order, signed May 24, 1977, prevents federal agencies from contributing to the “adverse impacts associated with occupancy and modification of floodplains” and the “direct or indirect support of floodplain development.” In the course of fulfilling their respective authorities, federal agencies “shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by 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 system.

Executive Order 13007—Indian Sacred Sites (1996):

Directs federal land management agencies to accommodate access to and ceremonial use 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.

Fish and Wildlife Act of 1956 (70 Stat. 1119; 16 U.S.C. 742a–742j), as amended: Establishes a comprehensive fish and wildlife policy and directs the Secretary of the Interior to provide continuing research; and extension and conservation of fish and wildlife resources.

Fish and Wildlife Improvement Act of 1978: Improves the administration of fish and wildlife programs and amends several earlier laws including the Refuge Recreation Act, the National Wildlife Refuge Administration Act, and the Fish and Wildlife Act of 1956. It authorizes the Secretary to accept gifts and bequests of real and personal property on behalf of the United States. It also authorizes the use of volunteers on Service projects and appropriations to carry out volunteer programs.

Land and Water Conservation Fund Act of 1965: Provides funds from leasing bonuses, production royalties and rental revenues for offshore oil, gas, and sulphur extraction to the Bureau of Land Management, the USDA Forest Service, the U.S. Fish and Wildlife Service, and state and local agencies for purchase of lands for parks, open space, and outdoor recreation.

Migratory Bird Conservation Act of 1929 (16 U.S.C. 715–715d, 715e, 715f–715r): Establishes the Migratory Bird Conservation Commission, which consists of the Secretaries of the Interior (chair), Agriculture, and Transportation; two members from the House of Representatives; and an ex-officio member from the state in which a project is located. The commission approves acquisition of land and water, or interests therein, and sets the priorities for acquisition of lands by the Secretary of the Interior for sanctuaries or for other management purposes. Under this Act, to acquire lands or interests therein, the state concerned must consent to such acquisition by legislation. Such legislation has been enacted by most states.

Migratory Bird Conservation Act of 1929 (16 U.S.C. 715s, 45 Stat. 1222), as amended: Authorizes acquisition, development, and maintenance of migratory bird refuges; cooperation with other agencies in conservation; and investigations and publications on North American birds. Authorizes

payment of 25 percent of net receipts from administration of national wildlife refuges to the country or counties in which such refuges are located.

Migratory Bird Hunting and Conservation Stamp Act of 1934 (16 U.S.C. 718–718h; 48 Stat. 51), as amended:

The “Duck Stamp Act,” as this March 16, 1934 authority is commonly called, requires each waterfowl hunter 16 years of age or older to possess a valid federal hunting stamp. The Act authorized the requirement of an annual stamp for the hunting of waterfowl. Proceeds go towards the purchase of habitat for waterfowl and other wildlife. Duck stamps are also purchased: (1) for entry into some refuges; (2) by conservationists; and (3) for stamp collections. Receipts from the sale of the stamp are deposited in a special Treasury account known as the Migratory Bird Conservation Fund and are not subject to appropriations.

Migratory Bird Treaty Act of 1918 (16 U.S.C. 703–711; 50 CFR subchapter B), as amended:

Implements treaties with Great Britain (for Canada) and Mexico for protection of migratory birds whose welfare is a federal responsibility. The act provides for regulations to control taking, possession, selling, transporting, and importing of migratory birds and provides penalties for violations. This Act enables the setting of seasons and other regulations (including the closing of areas, federal or nonfederal) related to the hunting of migratory birds.

National and Community Service Act of 1990 (42 U.S.C. 12401; 104 Stat. 3127):

Public Law 101-610, signed November 16, 1990, authorizes several programs to engage citizens of the United States in full and part-time projects designed to combat illiteracy and poverty, provide job skills, enhance educational skills, and fulfill environmental needs. The Act will make grants to states for the creation of programs for citizens over 17 years of age. Programs must be designed to fill unmet educational, human, environmental, and public safety needs. Initially, participants will receive postemployment benefits of up to \$1000 per year for part-time and \$2,500 for full-time participants.

Several provisions are of particular interest to the Service:

American Conservation and Youth Service Corps: As a federal grant program established under subtitle C of the law, the corps offers an opportunity for young adults between the ages of 16 and 25, or in the case of summer programs, between 15 and 21, to engage in approved human and natural resources projects that benefit the public or are carried out on federal or Indian lands. To be eligible for assistance, natural resources programs will focus on improvement of wildlife habitat and recreational areas, fish culture, fishery assistance, erosion, wetlands

protection, pollution control, and similar projects. A stipend of not more than 100 percent of the poverty level will be paid to participants. A commission established to administer the Youth Service Corps will make grants to states, the Secretaries of Agriculture and Interior, and the Director of ACTION to carry out these responsibilities.

Thousand Points of Light: Creates a nonprofit Points of Light Foundation to administer programs to encourage citizens and institutions to volunteer to solve critical social issues, discover new leaders, and develop institutions committed to serving others.

National Historic Preservation Act of 1966 (16 U.S.C. 470–470b, 470c–470n): Public Law 89-665, approved October 15, 1966 (80 Stat. 915), and repeatedly amended, provides for preservation of significant historical features (buildings, objects, and sites) through a grants-in-aid program to the states. It establishes the National Register of Historic Places and a program of matching grants under the existing National Trust for Historic Preservation (16 U.S.C. 468–468d). The Act establishes the Advisory Council on Historic Preservation, which was made a permanent independent agency in Public Law 94-422, approved September 28, 1976 (90 Stat. 1319). That Act also creates the Historic Preservation Fund. Federal agencies are directed to take into account the effects of their actions on items or sites listed or eligible for listing in the National Register. As of January 1989, 91 historic sites on national wildlife refuges have been placed on the National Register.

There are various laws for the preservation of historic sites and objects.

Antiquities Act (16 U.S.C. 431–433): The Act of June 8, 1906 (34 Stat. 225) authorizes the President to designate as national monuments objects or areas of historic or scientific interest on lands owned or controlled by the United States. The Act required that a permit be obtained for examination of ruins, excavation of archaeological sites, and the gathering of objects of antiquity on lands under the jurisdiction of the Secretaries of Interior, Agriculture, and Army, and provided penalties for violations.

Archeological and Historic Preservation Act (16 U.S.C. 469–469c): Public Law 86-523, approved June 27, 1960 (74 Stat. 220) as amended by Public Law 93-291, approved May 24, 1974 (88 Stat. 174) to carry out the policy established by the “Historic Sites Act” (see below), directed federal agencies to notify the Secretary of the Interior whenever they find a federal or federally assisted, licensed, or permitted project may cause loss or destruction of significant scientific, prehistoric, or archaeological data. The Act authorizes use of

appropriated, donated, and transferred funds for the recovery, protection, and preservation of such data.

Archaeological Resources Protection Act (16 U.S.C. 470aa–470ll): Public Law 96-95, approved October 31, 1979 (93 Stat. 721): Largely supplants the resource protection provisions of the Antiquities Act for archaeological items. This Act establishes detailed requirements for issuance of permits for any excavation for or removal of archaeological resources from federal or Indian lands. It also establishes civil and criminal penalties for the unauthorized excavation, removal, or damage of any such resources; for any trafficking in such resources removed from federal or Indian land in violation of any provision of federal law; and for interstate and foreign commerce in such resources acquired, transported, or received in violation of any state or local law.

Historic Sites, Buildings and Antiquities Act (16 U.S.C. 461–462, 464–467): The Act of August 21, 1935 (49 Stat. 666), popularly known as the “Historic Sites Act,” as amended by Public Law 89-249, approved October 9, 1965 (79 Stat. 971), declares it a national policy to preserve historic sites and objects of national significance, including those located on refuges. It provides procedures for designation, acquisition, administration, and protection of such sites. Among other things, National Historic and Natural Landmarks are designated under authority of this Act. As of January 1989, 31 national wildlife refuges contained such sites.

Public Law 100-588, approved November 3, 1988 (102 Stat. 2983): Lowers the threshold value of artifacts triggering the felony provisions of the Act from \$5,000 to \$500; makes attempting to commit an action prohibited by the Act a violation; and requires the land managing agencies to establish public awareness programs regarding the value of archaeological resources to the Nation.

National Environmental Policy Act of 1969 (P.L. 91-190, 42 U.S.C. 4321–4347, January 1, 1970, 83 Stat. 852) as amended by P.L. 94-52, July 3, 1975, 89 Stat. 258, and P.L. 94-83, August 9, 1975, 89 Stat. 424:

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 the implementation of all actions, federal agencies must integrate the Act with other planning requirements, and to prepare appropriate documents to facilitate better environmental decision making (40 CFR 1500). The Act declares national policy to encourage a productive and enjoyable harmony between humans and their environment. Section 102 of that Act directs that “to the fullest extent possible:

- the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this Act, and
- all agencies of the Federal Government shall...insure that presently unquantified environmental amenities and values may be given appropriate consideration in decision making along with economic technical considerations...”

Section 102(2)c of NEPA requires all federal agencies, with respect to major federal actions significantly affecting the quality of the human environment, to submit to the Council on Environmental Quality a detailed statement of:

- the environmental impact of the proposed action;
- any adverse environmental effect that cannot be avoided should the proposal be implemented;
- alternatives to the proposed action;
- the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity;
- any irreversible and irretrievable commitments of resources that would be involved in the proposed action, should it be implemented.

National Wildlife Refuge System Administration Act of 1966 (Public Law 89-669; 80 Stat. 929; 16 U.S.C. 668dd–668ee), as amended: This Act defines the National Wildlife Refuge System as including wildlife refuges, areas for protection and conservation of fish and wildlife that are threatened with extinction, wildlife ranges, game ranges, wildlife management areas, and WPAs. The Secretary is authorized to permit any use of an area provided such use is compatible with the major purposes for which such area was established. The purchase considerations for rights-of-way go into the Migratory Bird Conservation Fund for the acquisition of lands. By regulation, up to 40 percent of an area acquired for a migratory bird sanctuary may be opened to migratory bird hunting unless the Secretary finds that the taking of any species of migratory game birds in more than 40 percent of such area would be beneficial to the species. The Act requires an Act of Congress for the divestiture of lands in the system, except for (1) lands acquired with Migratory Bird Conservation Commission funds, and (2) lands that can be removed from the system by land exchange, or if brought into the system by a cooperative agreement, then pursuant to the terms of the agreement.

National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57, October 9, 1997, Amendment to the National Wildlife Refuge System Administration Act of 1966): Sets the mission and the administrative policy for all refuges in the National Wildlife Refuge System. Clearly 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; establishes the responsibilities of the Secretary of the Interior for managing and protecting the Refuge System; and requires a CCP for each refuge by the year 2012. This Act amended portions of the Refuge Recreation Act and the National Wildlife Refuge System Administration Act of 1966.

Key provisions include the following:

- a requirement that the Secretary of the Interior ensures maintenance of the biological integrity, diversity, and environmental health of the National Wildlife Refuge System
- the definition of compatible wildlife-dependent recreation as “legitimate and appropriate general public use of the [National Wildlife Refuge] System”
- the establishment of hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation as “priority public uses” where compatible with the mission and purpose of individual national wildlife refuges
- the refuge managers’ authority to use sound professional judgment in determining which public uses are compatible on national wildlife refuges and whether or not they will be allowed (a formal process for determining “compatible use” is currently being developed)
- the requirement of open public involvement in decisions to allow new uses of national wildlife refuges and renew existing ones, as well as in the development of CCPs for national wildlife refuges

National Wildlife Refuge System Volunteer and Community Partnership Enhancement Act of 1998:

The purposes of this Act are: (1) to encourage the use of volunteers to assist the Service in the management of refuges within the Refuge System; (2) to facilitate 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 those resources; and (3) to encourage donations and other contributions by persons and organizations to the Refuge System. (Public Law 105-242; 112 Stat. 1575)

North American Wetlands Conservation Act (103 Stat. 1968; 16 U.S.C. 4401–4412): Public Law 101-233, enacted December 13, 1989: An act to conserve North American wetland ecosystems, waterfowl and other migratory birds, fish, and wildlife that depend on such habitats. The Act established a council to review project proposals and provided funding for the projects. The Act provides funding and administrative direction for implementation of the North American Waterfowl Management Plan and

the Tripartite Agreement on wetlands between Canada, United States, and Mexico. The Act converts the Pittman–Robertson account into a trust fund, with the interest available without appropriation through the year 2006 to carry out the programs authorized by the Act, along with an authorization for annual appropriation of \$15 million plus an amount equal to the fines and forfeitures collected under the Migratory Bird Treaty Act. Available funds may be expended, upon approval of the Migratory Bird Conservation Commission, for payment of not to exceed 50 percent of the United States share of the cost of wetlands conservation projects in Canada, Mexico, or the United States (or 100 percent of the cost of projects on federal lands). At least 50 percent and no more than 70 percent of the funds received are to go to Canada and Mexico each year.

Refuge Recreation Act of 1962: Authorizes the Secretary of the Interior to administer refuges, hatcheries, and other conservation areas for recreational use, when such uses do not interfere with the areas' primary purposes. It authorizes construction and maintenance of recreational facilities and the acquisition of land for incidental fish and wildlife oriented recreational development or protection of natural resources. It also authorizes the charging of fees for public uses.

Refuge Recreation Act of 1966 (Public Law 87-714; 76 Stat. 653–654; 16 U.S.C. 460k et seq.): Authorizes appropriate, incidental, or secondary recreational use on conservation areas administered by the Secretary of the Interior for fish and wildlife purposes.

Refuge Revenue Sharing Act (16 U.S.C. 715s): Section 401 of the Act of June 15, 1935 (49 Stat. 383) provides for payments to counties in lieu of taxes, using revenues derived from the sale of products from refuges.

Public Law 88-523, approved August 30, 1964 (78 Stat. 701): Makes major revisions by requiring that all revenues received from refuge products such as animals, timber and minerals, or from leases or other privileges, be deposited in a special Treasury account and net receipts distributed to counties for public schools and roads.

Public Law 93-509, approved December 3, 1974 (88 Stat. 1603): Requires that moneys remaining in the fund after payments be transferred to the Migratory Bird Conservation Fund for land acquisition under provisions of the Migratory Bird Conservation Act.

Public Law 95-469, approved October 17, 1978 (92 Stat. 1319): Expands the revenue-sharing system to include national fish hatcheries and Service research stations. It also includes in the Refuge Revenue Sharing Fund receipts from the

sale of salmonid carcasses. Payments to counties were established as follows:

- On acquired land, the greatest amount calculated on the basis of 75 cents per acre, $\frac{3}{4}$ of 1 percent of the appraised value, or 25 percent of the net receipts produced from the land
- On land withdrawn from the public domain, 25 percent of net receipts and basic payments under Public Law 94-565 (31 U.S.C. 1601–1607, 90 Stat. 2662), payment in lieu of taxes on public lands

This amendment also authorizes appropriations to make up any difference between the amount in the Fund and the amount scheduled for payment in any year. The stipulation that payments be used for schools and roads was removed, but counties were required to pass payments along to other units of local government within the county that suffer losses in revenues due to the establishment of Service areas.

Refuge Trespass Act of June 28, 1906 (18 U.S.C. 41; 43 Stat. 98, 18 U.S.C. 145): Provides the first federal protection for wildlife on national wildlife refuges. This Act makes it unlawful to hunt, trap, capture, willfully disturb, or kill any bird or wild animal, or take or destroy the eggs of any such birds, on any lands of the United States set apart or reserved as refuges or breeding grounds for such birds or animals by any law, proclamation, or executive order, except under rules and regulations of the Secretary. The Act also protects government property on such lands.

Refuge Trespass Act of June 25, 1948 (18 U.S.C. 41. Stat 686), section 41 of the Criminal Code, title 18: Consolidates the penalty provisions of various acts from January 24, 1905 (16 U.S.C. 684–687; 33 Stat. 614), through March 10, 1934 (16 U.S.C. 694–694b; 48 Stat. 400) and restates the intent of Congress to protect all wildlife within federal sanctuaries, refuges, fish hatcheries, and breeding grounds. The Act provides that anyone (except in compliance with rules and regulations promulgated by authority of law) who hunts, traps, or willfully disturbs any wildlife on such areas, or willfully injures, molests, or destroys any property of the United States on such lands or waters, shall be fined, imprisoned, or both.

Rehabilitation Act of 1973 (29 U.S.C. 794), as amended: Title 5 of P.L. 93-112 (87 Stat. 355), signed October 1, 1973, prohibits discrimination on the basis of handicap under any program or activity receiving federal financial assistance.

Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948: Provides that, upon determination by the Administrator of the General Services Administration, real property no

longer needed by a federal agency can be transferred without reimbursement to the Secretary of the Interior if the land has particular value for migratory birds, or to a state agency for other wildlife conservation purposes.

Wilderness Act of 1964: Public Law 88-577, approved September 3, 1964, directs the Secretary of the Interior, within 10 years, to review every roadless area of 5,000 or more acres and every roadless island (regardless of size) within National Wildlife Refuge System and National Park Service for inclusion in the National Wilderness Preservation System.

NATIONAL WILDLIFE REFUGE SYSTEM

Administration of national wildlife refuges is governed by bills passed by the United States Congress and signed into law by the President of the United States, and by regulations promulgated by the various branches of the government. Following is a brief description of some of the most pertinent laws and statutes establishing legal parameters and policy direction for the National Wildlife Refuge System.

Fish and Wildlife Conservation Act of 1980 (Public Law 96-366, September 29, 1980, 16 U.S.C. 2901–2911, as amended 1986, 1988, 1990, and 1992): Creates a mechanism for federal matching funding of the development of state conservation plans for nongame fish and wildlife. Subsequent amendments to this law require that the Secretary monitor and assess migratory nongame birds, determine the effects of environmental changes and human activities, identify birds likely to be candidates for endangered species listing, and identify conservation actions that would prevent this from being necessary. In 1989, Congress also directed the Secretary to identify lands and waters in the Western Hemisphere, the protection, management, or acquisition of which would foster conservation of migratory nongame birds. All of these activities are intended to assist the Secretary in fulfilling the Secretary's responsibilities under the Migratory Bird Treaty Act and the Migratory Bird Conservation Act, and provisions of the ESA implementing the Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere.

Refuge Revenue Sharing Act of 1978 [Public Law 95-469, October 17, 1978, (amended 16 U.S.C. 715s); 50 CFR, part 34]: Changes the provisions for sharing revenues with counties in a number of ways. It makes revenue sharing applicable to all lands administered by the Service, whereas previously it was applicable only to areas in the National Wildlife Refuge System. The new law makes payments available for any governmental purpose, whereas

the old law restricted the use of payments to roads and schools. For lands acquired in fee simple, the new law provides a payment of 75 cents per acre, $\frac{3}{4}$ of 1 percent of fair market value or 25 percent of net receipts, whichever is greatest, whereas the old law provided a payment of $\frac{3}{4}$ of 1 percent adjustment cost or 25 percent of net receipts, whichever was greater. The new law makes reserve (public domain) lands entitlement lands under Public Law 94-565 (16 U.S.C. 1601–1607, and provides for a payment of 25 percent of net receipts. The new law authorizes appropriations to make up any shortfall in net receipts, to make payments in the full amount for which counties are eligible. The old law provided that if net receipts were insufficient to make full payment, payment to each county would be reduced proportionality.

Section 401 of the Federal Water Pollution Control Act of 1972 (Public Law 92-500; 86 Stat. 816, 33 U.S.C. 1411): Requires any applicant for a federal license or permit to conduct any activity that may result in a discharge into navigable waters to obtain a certification from the state in which the discharge originates or will originate, or, if appropriate, from the interstate water pollution control agency having jurisdiction over navigable waters at the point where the discharge originates or will originate, that the discharge will comply with applicable effluent limitations and water quality standards. A certification obtained for construction of any facility must also pertain to subsequent operation of the facility.

Section 404 of the Federal Water Pollution Control Act of 1972 (Public Law 92-500, 86 Stat. 816): Authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits, after notice and opportunity for public hearing, for discharge of dredged or fill material into navigable waters of the United States, including wetlands, at specified disposal sites. Selection of disposal sites will be in accordance with guidelines developed by the Administrator of the Environmental Protection Agency in conjunction with the Secretary of the Army. Furthermore, the Administrator can prohibit or restrict use of any defined area as a disposal site whenever she/he determines, after notice and opportunity for public hearings, that discharge of such materials into such areas will have an unacceptable adverse effect on municipal water supplies, shellfish beds, fishery areas, wildlife, or recreational areas.

National Wildlife Refuge Regulations for the most recent fiscal year (50 CFR 25-35, 43 CFR 3103.2 and 3120.3–3): Provides regulations for administration and management of national wildlife refuges including mineral leasing, exploration, and development.

Rights-of-way General Regulations (50 CFR 29.21; 34 FR 19907, December 19, 1969): Provides for procedures for filing applications. Provides terms and conditions under which rights-of-way over, above, and across lands administered by the Service may be granted.

Use of Off-road Vehicles on Public Lands (Executive Order 11644, Federal Reg. Vol. 37, No. 27, February 9, 1972): Provides policy and procedures for regulating off-road vehicles.

RECREATIONAL USE

The following are laws and executive orders that regulate recreational use on Refuge System lands.

Alaska National Interest Lands Conservation Act of 1980 (16 U.S.C. 410 hh3233 and 43 U.S.C. 1602–1784)

Alaska Native Claims Settlement Act (43 U.S.C. 1601–1624)

Antiques Act of 1906 (16 U.S.C. 431–433)

Archaeological and Historic Preservation Act of 1960 (16 U.S.C. 469–469c), as amended

Archaeological Resources Protection Act of 1979 (16 U.S.C. 470aa–470mm)

Comprehensive Environmental Responses, Compensation and Liability Act of 1980

Endangered Species Act of 1973 (16 U.S.C. 1531–1544), as amended

The Fish and Wildlife Act of 1956 (16 U.S.C. 742f (a) (4), as amended

Fish and Wildlife Conservation Act (16 U.S.C. 2901–2911), as amended

The Fish and Wildlife Coordination Act [16 U.S.C. 661(1)–662(c)]

Fish and Wildlife Improvement Act of 1978 (16 U.S.C. 7421)

Historic Sites, Building and Antiquities Act of 1935 (16 U.S.C. 461–462, 464–467)

Land and Water Conservation Fund [16 U.S.C. 460(l–4)–(l–11)], as amended.

Migratory Bird Conservation Act of 1929 (16 U.S.C. 715–715d, 715e, 715f–715r), as amended

National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd–669ee), as amended

National Wildlife Refuge System Improvement Act of 1997

Natural Historic Preservation Act of 1966 (16 U.S.C. 470–470b, 470c–470n), as amended

Refuge Recreation Act of 1962 (16 U.S.C. 460k–460k4), as amended

Refuge Recreation Act of 1969 (16 U.S.C. 460k–460k4), as amended

Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970, as amended

Wild and Scenic Rivers Act (16 U.S.C. 1271–1287), as amended

Wilderness Act of 1964 (16 U.S.C. 1131–1136)

Executive Order 11593—Protection and Enhancement of the Cultural Environment

Executive Order 11593—Protection of Historical, Archaeological and Scientific Properties

Executive Order 11644—Use of Off-road Vehicles on Public Lands

Executive Order 11988—Floodplain Management

Executive Order 11990—Protection of Wetlands

Executive Order 12372—Intergovernmental Review of Federal Program

Executive Order 12962—Recreational Fisheries

Executive Order 12996—Management and General Public Use of the National Wildlife Refuge System

Executive Order 13006—Locating Federal Facilities On Historic Properties In Our Nation's Central Cities

Executive Order 13007—Indian Sacred Sites

Executive Order 13287—Preserve America

REFUGE ESTABLISHMENT HISTORY

The MPC owned and operated Kerr Dam, a hydro-generating facility located on the Flathead River approximately 2.5 miles southwest of the southern end of Flathead Lake. In 1976, the MPC filed an application with the FERC for a new license to operate the Kerr project. Kerr Dam is located within the exterior boundaries of the Flathead Indian Reservation (CSKT). Subsequent to the MPC re-license application, the CSKT filed a competing application for operation of the dam. From 1980 to 1985, the MPC operated the Kerr project under

successive annual operating licenses, pending resolution of a number of legal and environmental issues and studies.

In 1985, FERC issued an EA that evaluated the environmental effects of issuing a license for the Kerr Project. The EA further identified hydro-project impacts to aquatic and wildlife resources and wildlife habitat on the Flathead WPA located at the north end of Flathead Lake. These impacts included severe wave action erosion of wildlife habitats on the WPA due to seasonal increases in lake levels. The WPA is administered as an entity of the National Wildlife Refuge System, thus national wildlife trust

resources were impacted by hydro-operations that began in 1938.

After a period of review, biological studies, assessments, and subsequent litigation; the MPC, CSKT, and Department of Interior (DOI) ultimately reached a settlement in 1985 that was approved by FERC and incorporated into a new 50-year license issued jointly to the MPC and the CSKT. Article 47 of the new license required the MPC to study and develop mitigation and management measures for the loss of wildlife habitat on the Flathead WPA. In May 1990, after consultation with the CSKT and the Service, the MPC issued a mitigation and management plan. Subsequent to review of this plan, and determination that the MPC's plan would constitute a major federal action, FERC issued an environmental impact statement (EIS). In 1994, under authority of the Federal Power Act, the DOI submitted 4e conditions, which would provide for adequate protection and use of the Flathead Indian Reservation and the Flathead WPA. In 1997, FERC issued an "Order Approving Settlement" that required the MPC to acquire 3,911 acres of suitable replacement habitat as partial mitigation for wildlife losses and impacts on the WPA. This replacement habitat acreage was to be conveyed to the Service in fee title.

In 1985, the Service identified the need to evaluate the future of land acquisition in Flathead and Lake counties, Montana. This need resulted from pending MPC mitigation due to identified habitat losses and wildlife impacts on the Flathead WPA. In 1986, the Service prepared a land acquisition and development plan. This document delineated over 11,000 acres of potential wetland and upland tracts in the Flathead Valley that would be suitable for wetland-dependent wildlife production and management. The 160-acre Dahl Lake and surrounding habitats, located in the Pleasant Valley, were identified in the document.

Establishment of the Lost Trail National Wildlife Refuge began in June of 1996 when the MPC purchased the Lost Trail Ranch with the intent of conveying 3,112 acres to the Service per the FERC order requiring replacement of lost habitat. Two separate parcels of the ranch were identified as mitigative replacement habitat:

- 160-acre Dahl Lake with 2,452 acres of surrounding habitat
- 500 acres of restorable wetlands located on the west end of the ranch

After review of the proposed conveyed parcels and in consideration of additional wildlife needs within the area, the Service proposed acquisition of the remaining ranch tracts for establishment of a national wildlife refuge. The MPC readily agreed to this concept. In early 1998, a preliminary project proposal, conceptual management plan, and

acquisition EA were prepared. The acquisition EA listed several alternatives:

- No action—acceptance of the two mitigation parcels (3,112 acres) to be managed as a WPA
- Acceptance of the mitigation parcels to be managed as a national wildlife refuge
- Mitigation and fee-title acquisition of lands as a national wildlife refuge

Alternative C was the preferred alternative. A scoping meeting was held in Kalispell, Montana, on May 20, 1998, to solicit public comment concerning Service acquisition of Lost Trail Ranch. The concept of establishment of a national wildlife refuge received little opposition.

After considerable efforts by the Service's realty division (Denver), acquisition of the Lost Trail National Wildlife Refuge was completed on August 24, 1999.

During the interim acquisition period (1998–1999), the NRCS, in conjunction with the MPC, acquired a WRP easement on 1,770 acres of the ranch. This easement allows for the restoration of the hydrology of the area. Restoration efforts will be federally funded through NRCS in coordination with the Service.

PUBLIC USE

The Improvement Act of 1997, the organic legislation of the Refuge System, recognizes six wildlife-dependent "priority public uses" that are most appropriate for national wildlife refuges. These are hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation. National refuge policy encourages refuges to offer these opportunities and to seek out additional resources when needed to do so. There is a special focus on these activities because they help foster an appreciation and understanding of wildlife and the outdoors.

Wildlife conservation is always the top obligation of national wildlife refuges, and refuges must go through several steps when evaluating a public use. If a use is not one of the priority public uses, the first step is to evaluate it against several criteria to determine whether the use is appropriate for a specific national wildlife refuge. All uses must also be determined to be compatible—meaning that they will not materially detract from or interfere with the refuge's establishing purpose or Service mission. The third step is to determine whether the refuge has the resources to administer the use safely and responsibly. If a priority public use is appropriate and compatible, but the refuge staff lacks the resources to administer the use, refuge managers are encouraged to seek additional resources from outside sources, such as nonprofit partner organizations and state natural resource agencies.

The priority uses are first in line for the refuge's available public use staff and financial resources. If conflicts arise between priority uses and other uses, refuge managers must eliminate the nonpriority use or modify that use to reduce conflict.

Refuge managers may allow (with written justification) other compatible public uses. When considering other uses, the refuge manager will prepare a compatibility determination when necessary. Non-wildlife-dependent activities can be allowed when needed to provide access to, help implement, or sustain a priority use when no other way is practicable. Refuge managers must determine the appropriateness as well as compatibility of such uses before allowing them to occur on Refuge System lands. For example, camping may be necessary to facilitate hunting on large remote refuges but may not be necessary to facilitate hunting on refuges near developed areas where camping or other lodging is available.

Refuge managers may establish use limits and/or zones for specific activities, disperse or restrict use, or use other means to minimize or eliminate conflict between uses that occur at refuges. Nonpriority uses, if allowed, must not interfere with or diminish the opportunity for, or quality of, priority wildlife-dependent recreational uses. Using zones or the establishment of limits, the Service can generally provide a balanced recreation program and avoid favoring one priority recreational opportunity over another when both are compatible.

It is recognized, however, that some refuges may not support public use. Many refuges only support limited public use and not every priority use can be accommodated on every refuge. If it is determined that a refuge can support one or more of these uses, the priority wildlife-dependent recreational use must receive preferential consideration in refuge planning and management before the refuge manager analyzes other appropriate recreational opportunities.

The "appropriate use" test for nonpriority public uses occurs before the refuge manager begins a compatibility determination. The appropriate use test is designed to screen out uses that are not among the priority public uses and which are clearly not related to the refuge's wildlife conservation mission. Compatibility reviews determine whether any use will detract from the refuge's ability to meet its conservation obligations. If an existing or proposed use is determined to be appropriate, then the use must still be reviewed for compatibility before it may be allowed or continued to be allowed. If a use is not appropriate, then a compatibility determination is not necessary. A use should not be allowed simply because it is a historical use but should go through this process to determine appropriateness and compatibility.

An appropriate use of a refuge is a proposed or existing use that meets at least one of the following three conditions:

1. The use is a priority public use or is necessary for the safe, practical, and effective conduct of a priority public use on a refuge.
2. The use contributes to the Refuge System mission, or the refuge purposes, goals, or objectives as described in a refuge management plan (such as this CCP) approved after the passage of the refuge Improvement Act.
3. The refuge manager has determined the use to be appropriate after evaluating 11 factors designed to screen out uses that could conflict with stewardship responsibilities for the wildlife conservation mission of the Refuge System, interfere with priority public uses, or which do not contribute to an overall understanding and appreciation of wildlife resources.

The 11 factors a refuge manager would use to determine if a use is appropriate follow.

1. Does the use comply with applicable laws and regulations?
2. Is the use consistent with applicable executive orders and Department and Service policies?
3. Is the use consistent with refuge goals and objectives documented in an approved refuge management plan?
4. Has an earlier documented analysis not denied the use?
5. Is the use consistent with public safety?
6. Is the use manageable within available budget and staff?
7. Is the use consistent with other resource or management objectives?
8. Will the use be easy to control in the future?
9. Is the refuge the only place where this activity can reasonably occur?
10. Does the use contribute to the public's understanding and appreciation of the refuge's wildlife or cultural resources, or is the use beneficial to the refuge's wildlife or cultural resources?
11. Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality wildlife-dependent recreation into the future?

If the answer is "no" to any of these questions, the Service will generally not allow the use. If the answers are consistently "yes" to these questions, or if there are compelling reasons why the refuge

manager believes the use is appropriate on the refuge, the refuge manager then prepares written justification, and obtains concurrence from his/her supervisor.

Refuge managers, with assistance from regional offices as well as the public, must adequately monitor recreational activities on the Refuge System lands. Monitoring programs must focus on the impacts of recreational activities on wildlife, habitat, and the quality of experience for the public. By implementing successful monitoring techniques, the Service can evaluate and adaptively manage to meet established standards and ensure that activities continue to be appropriate, compatible, and of high quality.

The following general criteria (from the “Draft Wildlife-dependent Recreational Uses Policy Pursuant to the Improvement Act”) will help refuge managers decide what recreational activities to allow, encourage, or develop, and at what level. Refuge managers must eliminate—with adequate consultation, documentation, and cooperation with affected federal, state, tribal, local authorities, and groups—programs that do not meet these criteria.

- *Ensure appropriateness.* Refuge managers, in consultation with regional offices when deemed necessary, must first consider if a use is appropriate on Refuge System lands. Refuge managers must be able to show why the requested use supports the Refuge System mission and the purpose of the refuge before investing additional resources for a compatibility determination.
- *Ensure compatibility.* Refuge managers must:
 - exercise sound professional judgment (compatibility determinations are inherently complex and require the refuge manager to consider their field experiences and knowledge of a refuge's resources, particularly its biological resources, and make conclusions that are consistent with principles of sound fish and wildlife management and administration, available scientific information, and applicable laws);
 - consider the extent to which available resources (funding, personnel, and facilities) are adequate to develop, manage, and maintain the proposed use to ensure compatibility (the refuge manager must make reasonable efforts to ensure that the lack of resources is not an obstacle to permitting otherwise compatible wildlife-dependent recreational uses—hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation);
 - under no circumstances (except emergency provisions necessary to protect the health and safety of the public or any fish or wildlife population), authorize any use not determined to be compatible.
- *Focus on wildlife.* Wildlife conservation is the first priority of the Refuge System, and new and ongoing recreational use programs should help visitors focus on wildlife and other natural resources. Activities should make visitors aware of the most important resource issues at the refuge, be supportive of management plans that address those issues, and show how the refuge contributes to the mission of the Refuge System.
- *Tailor programs to refuge needs and ability to administer the program.* Refuge managers will determine and document:
 - the design and scope of a refuge recreational use program after evaluating the wildlife-dependent uses that are appropriate, compatible, and practical at that refuge; the amount and type of visitation; constraints of the location; traditions/viewpoints of the local populace; legal commitments; other opportunities in the area; public interest; resource management concerns; and other criteria;
 - a realistic demand for the activity (this is important because activities generally are harder to curtail or stop than to begin; refuge managers must have an eye to the future and be ready for possible changes in staffing, funding, or other program elements that may occur).
- *Follow an approved plan.* Before administering priority uses or identifying and allowing mandated or nonpriority uses at a refuge, the refuge manager should consult the refuge's CCP, visitor-service management plan, and other applicable step-down plans. The documents will outline program objectives and other specific information that will provide the guidance needed to manage these activities.
- *Ensure adequate resources.* Refuge managers will:
 - offer wildlife-dependent recreational use programs only to the extent that staff and funds are sufficient to develop, operate, and maintain the program to safe, quality standards (refuge managers should remember that, in general, the greater the scope and complexity of a program, the greater the need for staff and money; where wildlife-dependent recreational uses cannot occur at a refuge due to insufficient resources, refuge managers will try to facilitate these programs through user fee programs and cooperative efforts, including memorandums of understanding, cost-share agreements, sharing personnel with nearby refuges, and others; conservation partnerships or other groups can help refuge managers more effectively finance and administer recreational use programs on refuges by providing labor, funds, or other types of support; where available and appropriate, refuge managers should work with cooperating associations, volunteers, contractors, businesses,

local communities, educational institutions, state and tribal governments, other federal agencies, conservation groups, other organizations, and the public to minimize or reduce the costs of conducting recreational use programs; the community relations benefits of such an approach are effective and far-reaching);

- seek opportunities to develop formal agreements, contracts, cooperative ventures, and community sponsorships to fund equipment and supplies, maintain facilities, conduct training, provide technical assistance, and help with other aspects of a quality recreational use program (refuge managers should not enter into agreements that unnecessarily encumber lands and facilities or hinder meeting the resource management objectives).

HUNTING

The Service recognizes hunting as a healthy, traditional outdoor pastime, deeply rooted in American heritage, and when managed appropriately, can instill a unique understanding and appreciation of wildlife, their behavior, and their habitat needs. Hunting also is an important wildlife management tool on refuges. The Service relies on close cooperation and coordination with state fish and wildlife management agencies in managing hunting opportunities on refuges and in setting management goals and objectives for refuge populations. Regulations permitting hunting of resident wildlife within the Refuge System shall be, to the extent practicable, consistent with state fish and wildlife laws, regulations, and management plans. The Service encourages refuge staff to develop and take full advantage of opportunities to work with other partners who have an interest in helping promote quality hunting programs on refuges.

The Service defines a quality hunting experience as one that:

- maximizes safety for hunters and other visitors;
- encourages the highest standards of ethical behavior in taking or attempting to take wildlife;
- is available to a broad spectrum of the hunting public;
- contributes positively to or has no adverse effect on population management of resident or migratory species;
- reflects positively on the individual refuge, the Refuge System, and the Service;
- provides hunters uncrowded conditions by minimizing conflicts and competition among hunters;
- provides reasonable challenges and opportunities for taking targeted species under the described harvest objective established by the hunting

program; it also minimizes the reliance on motorized vehicles and technology designed to increase the advantage of the hunter over wildlife;

- minimizes habitat impacts;
- creates minimal conflict with other priority wildlife-dependent recreational uses or refuge operations;
- incorporates a message of stewardship and conservation in hunting opportunities.

Prior to establishment as a national wildlife refuge, Lost Trail had always been in private ownership. Although ranch owners and invited guests hunted the area, public hunting was not permitted. Opening the refuge to hunting and other public uses may negatively affect large mammal populations on the refuge and in the Pleasant Valley ecosystem. Monitoring will help managers assess the impacts of public use and other management decisions.

Hunt Environmental Assessment

The refuge developed a hunt EA and hunt plan during 2001. In summary, the 2001 hunt EA contained six alternatives. Alternative A (limited hunting) provided for archery-only hunting of elk and deer, as well as turkey and mountain grouse hunting, within designated areas. Alternative B (designated areas) was selected as the preferred alternative and provides for archery and rifle hunting of deer and elk, as well as turkey and mountain grouse, within designated areas. Alternative C (maximum allowable hunting) would have allowed hunting throughout the refuge for big game (elk, deer, moose, bear, lion), turkey, and upland game birds as well as predators. Alternative D (special permit hunting) provided for deer and elk hunting throughout the refuge under a permit season, as well as allowing turkey and grouse hunting. Alternative E (MFWP proposal) was suggested by the MFWP and would have allowed gun and archery hunting of deer and elk, waterfowl hunting on 40 percent of the refuge, turkey and grouse hunting, and rifle/shotgun hunting of furbearers. Alternative F (no action) would have continued the closure of the refuge to any form of hunting. These alternatives are explained in detail in the EA. Copies are available at the National Bison Range (406/644 2211) or at <http://bisonrange.fws.gov/losttrail/lastea.pdf>.

The preferred alternative selected from the hunt EA released in 2001 is alternative B (designated areas) with modifications. This alternative allows for hunting of elk, deer, mountain grouse (ruffed, spruce, and blue) and turkey following MFWP regulations and seasons except for designated closed areas (appendix F). No hunting would be allowed between the county road (Pleasant Valley Road) and the South Pleasant Valley Road. Hunting would be permitted on refuge lands south or east of the South Pleasant Valley Road (southeast pond area) and

north of the county road. Shotgun hunting for turkey and mountain grouse would be limited to nontoxic shot. Hunting of moose, mountain lion, black bear, coyote, ground squirrels, furbearers and waterfowl would not be allowed. Vehicle access would be permitted on roads currently open to the public including the north 1019 road and the county road. Hunters would be required to park in designated parking areas to access areas open to hunting (appendix F).

Special youth hunting and access for hunters with disabilities would be encouraged and accommodated following MFWP regulations. Youth hunting will be further encouraged by limiting the first week of archery deer and elk season and the first week of the general deer and elk season to youths 12–14 years of age accompanied by an adult or guardian who is at least 21 years of age. Hunters with disabilities in possession of a MFWP permit to hunt from a vehicle will be provided limited access to refuge management roads and trails.

All or any part of the refuge may be closed to hunting by the refuge manager whenever necessary to protect the resources of the area or in the event of an emergency endangering life or property. In addition, according to refuge policy (SRM 5.3B, 5.3F, and 5.5N), yearly evaluation and monitoring for impacts from the hunt program will occur to determine if modifications to the hunt plan are necessary.

One step-down management plan has already been completed for the refuge—the hunt plan. During the acquisition process and in the acquisition EA, the Service stated that hunting would be evaluated and potentially allowed within 1 year after purchase. The Service missed that deadline but the development of a hunt EA and hunt plan were then accelerated to open the refuge to hunting for the fall 2002 season, concurrently with the development of the CCP. The approved preferred alternative in the hunt EA served as the guideline for the development of the step-down hunt plan. It outlines the specific details of how the hunt program is carried out. The hunt EA and hunt step-down plan can be viewed online at <http://bisonrange.fws.gov/losttrail/> or a copy can be obtained by writing to the refuge.

FISHING

The Service recognizes fishing as a traditional outdoor pastime that is deeply rooted in America's natural heritage. The objectives of the Refuge System's fishing program are to: effectively maintain healthy and diverse fish population resources through the use of scientific management techniques; to promote public understanding of, and increase public appreciation for, America's natural resources and the Service's role in managing the Refuge System; to provide opportunities for quality recreational and educational experiences; and to

minimize conflicts between anglers and other visitors.

A quality fishing experience is one that contributes to management objectives and accomplishes the following:

1. maximizes safety for anglers and other visitors;
2. causes no adverse impact on populations of resident or migratory species, native species, threatened and endangered species, or habitat;
3. encourages the highest standards of ethical behavior in regard to catching, attempting to catch, and releasing fish;
4. is available to a broad spectrum of the public that visits, or potentially would visit, the refuge;
5. provides reasonable accommodations for individuals with disabilities to participate in refuge fishing activities;
6. reflects positively on the Refuge System;
7. provides uncrowded conditions;
8. creates minimal conflict with other priority wildlife-dependent recreational uses or refuge operation;
9. provides reasonable challenges and harvest opportunities;
10. increases the visitors' understanding and appreciation for the fishery's resource.

WILDLIFE PHOTOGRAPHY AND OBSERVATION

Wildlife photography and observation are legitimate and appropriate public uses of the Refuge System, and along with the other priority public uses in the Improvement Act, will receive enhanced consideration over other uses. The objectives of the Refuge System's wildlife photography and observation program are to promote public understanding of and increase public appreciation for America's natural resources and the Refuge System by providing safe, enjoyable, attractive, and accessible wildlife-viewing and photographic opportunities and facilities.

Essential elements of a quality wildlife photographic or observation experience include the following:

- Opportunities occur in places with the least amount of disturbance to wildlife.
- Opportunities occur in a primitive setting or use safe facilities and provide an opportunity to photograph and view wildlife and its habitat in a natural environment.
- Facilities or programs maximize opportunities to photograph and view the spectrum of wildlife species and habitats of the refuge.

- Photographic and viewing opportunities, in conjunction with interpretive and educational opportunities, promote public understanding of and increase public appreciation for America's natural resources and the role of the Refuge System in managing and protecting these resources.
- Viewing and photographic opportunities are tied to interpretive and educational messages related to stewardship and key resource issues.
- If provided, most facilities blend with the natural setting, station architectural style, and provide viewing and photographic opportunities for all visitors, including persons with disabilities.
- Design of observation facilities minimizes disturbance to wildlife while facilitating the visitor's views and photographic opportunities of the spectrum of species found on the refuge.
- Photographers and observers understand and follow procedures that encourage the highest standards of ethical behavior.
- Viewing and photographic opportunities exist for a broad spectrum of the public.
- Observers and photographers have minimal conflict with other priority wildlife-dependent recreational uses or refuge operations.

INTERPRETATION

Refuges will promote public awareness and advocacy of resources and management activities that conserve the region's natural, cultural, and historical resources through interpretive products. Service objectives for interpretive programs are to develop and maintain interpretive programs on refuges to:

1. increase public understanding and support for the Refuge System;
2. develop a sense of stewardship leading to actions and attitudes that reflect concern and respect for wildlife resources, cultural resources, and the environment;
3. provide an understanding of the management of our natural and cultural resources;
4. provide safe, enjoyable, accessible, meaningful, and quality experiences for visitors increasing their awareness, understanding, and appreciation of fish, wildlife, plants, and their habitats.

Well-designed interpretive services can be our most effective and inexpensive resource management tool. For many visitors, taking part in one or more interpretive activities is their primary contact with refuge staff, their chance to find out about refuge messages, and could be their first contact with the refuge, conservation, and wildlife. Through these contacts, the Service has the opportunity to

influence visitor's attitudes toward the Service and their behaviors when visiting units of the Refuge System. Interpretive planning and subsequent activities and products can:

1. help visitors understand the impacts of their actions, minimizing unintentional resource damage and wildlife disturbance;
2. communicate rules and regulations so they relate to visitors, solving or preventing potential management problems;
3. help us make management decisions and build public support by providing insight into management practices.

There are two broad categories of interpretive activities: self-guided and personal services. Self-guided interpretation includes brochures, exhibits, kiosks, audiovisual media (including computer programs), and self-guided trails. Personal services interpretation includes information desk duty, group presentations, guided talks and tours, and special events. Variety in interpretive experiences will appeal to a broad spectrum of interests and learning styles. Refuges should strive for:

- quality, self-guided services, since they reach a larger audience, are more readily available, and visitors can use them at their own pace;
- quality personal contact to initiate conversation and answer questions;
- a variety of interpretive experiences that appeal to varying visitor interests.

ENVIRONMENTAL EDUCATION

The refuge's goal for environmental education is to teach awareness, understanding, and appreciation of our trust resources and develop a sense of stewardship for natural and cultural resources and their management at the refuge, in the ecosystem and on other lands in the Refuge System.

To advance and support the National Wildlife Refuge System mission and goals, refuges will develop programs based on the following guidelines.

1. Connect people's lives to the health of the environment.
2. Advance science literacy through an interdisciplinary educational approach.
3. Strengthen the Refuge System through science learning.
4. Help participants experience the wonder of fish, wildlife, plants, and cultural and historical resources.
5. Stress the role and importance of refuges and emphasize the relationship between wildlife and associated ecosystems.

6. Be outcome-based, going beyond attending a program to resulting in something of value for both refuge resources and participants.
7. Pursue outreach and partnership opportunities enhancing programs on and off refuges and expanding our levels of educational expertise and staffing.
8. Include lesson plans and refuge activity guides that incorporate, complement, and focus on local school curricula allowing participants to use refuges as living laboratories.
9. Train educators, volunteers, and partners in resource issues in order to multiply Service efforts across a broader spectrum of students.
10. Establish, maintain, and promote environmental study sites and outdoor classrooms where they are compatible with refuge purpose(s), goals, and objectives.
11. Involve underserved populations like urban or rural schools, Native Americans, non-English-speaking populations, senior citizens, people with disabilities, and groups in the educational community other than K–12 such as colleges and universities.
12. Expand the Service's capability through technology such as web pages and electronic field trips.
13. Use appropriate formats for visitors with disabilities (learning, visual, hearing).

Refuge environmental education programs will:

- provide appropriate materials, equipment, facilities, and study locations to support environmental education, where compatible;
- allow program participants to demonstrate learning through refuge-specific stewardship tasks as well as projects that they can carry over into their everyday lives;
- establish partnerships to support environmental education on refuges open to the public;
- incorporate local, state, and national educational standards in our programs with an emphasis on wildlife conservation;
- assist refuge staff and volunteers to attain the knowledge, skills, and abilities to support environmental education at a minimum level;
- teach awareness, understanding and appreciation of our trust resources;
- serve as a means by which refuge employees are seen as role models for environmental stewardship through a continually developing positive relationship with the community.

While reference materials provide good background to the refuge, the Refuge System and the Service, nothing is more effective in fostering appreciation

and understanding of the resource that hands-on experiences. The EPA recommends moving away from textbook-driven instruction by using “hands-on, learner-centered, and cooperative learning” approaches where students are actively engaged in the learning process (EPA 1999). Involving students in some simple monitoring projects would instill a sense of ownership and stewardship to the resources. This is a good way to advance science literacy through an interdisciplinary educational approach.

For refuges that have staffs of less than 5 full-time equivalent (FTE) employees and do not have any positions solely dedicated to public use activities, the Service recommends that field station environmental education programs, at a minimum, should include:

- creating or providing a lending library of materials and resources for teachers and other educators;
- designating a trained staff contact person for environmental education;
- designating a study site and providing stewardship opportunities;
- helping local educators identify refuge resources and develop programs;
- forming partnerships or recruiting and training volunteers including senior citizens and people with disabilities to conduct environmental education activities.

For refuges that have staffs of approximately 5–9 FTEs, do not have any positions solely dedicated to public use, and have a refuge manager position at the GS-11 to GS-12 level, the Service recommends field stations to:

- conduct and/or host teacher training workshops;
- provide educators with refuge-specific curriculum, activities, and lesson plans;
- develop accessible outdoor classrooms;
- establish formal partnerships with school districts and community groups to assist with development and implementation of refuge environmental education programming;
- recruit and train volunteers to assist in developing and presenting environmental education programming;
- conduct regular environmental education program evaluation;
- provide opportunities to contribute to refuge management goals through learning and stewardship activities;
- establish a lending library of educational materials including but not limited to book, trunk, and multimedia resources;

- conduct some on-site and occasional off-site environmental education programming;
- employ key staff who has acquired the skills to develop and conduct environmental education activities.

For refuges that have staffs of approximately 10–14 FTEs with 1 position solely dedicated to public use, and have a refuge manager at the GS-12 to GS-13 level. At the enhanced level, the Service encourages field stations to:

- develop a multidisciplinary environmental education program with integrated curricula meeting national and state educational standards;
- adapt the refuge's program to increase participant learning and connect environmental health with quality of life;
- develop multiple facilities or study sites, with materials and equipment, that support refuge goals and objectives;
- seek to hire professionally trained refuge environmental education staff;
- conduct refuge-specific workshops, special events, and symposia, including day camps, after-school and off-site programs, elder hostels, and extended learning opportunities;
- provide environmental education training and mentoring opportunities for educators, Service staff, and others;
- have an environmental education program that demonstrates student learning through measurable objectives;
- create an extensive environmental education outreach program for reaching participants outside the local area;
- allow the environmental education staff to continue to develop professionally by attending training;
- use technology to interface with off-site participants through the Internet, distance learning, and websites;
- establish partnerships beyond local communities.

Field stations will establish educational program priorities based on their objectives and mandates, as well as local, state, and national priorities. As part of refuge planning, the Service evaluates educational programs and offer differing levels of environmental education based in part on the number of staff with public use duties as well as other available resources. Other factors that determine the level of involvement include demand for educational programs, the number of schools near a refuge, and their willingness to participate.

WATER RIGHTS

The refuge is nestled near the headwaters of Pleasant Valley Creek, a tributary to the Fisher River, which is a tributary to the Columbia River. The earliest stock water and irrigation claims for the ranch date back to 1890 and 1899, respectively. The amended ranch irrigation claims describe 1,572 acres irrigated with 10,930 acre-feet per annum. The combined irrigation diversion rate at the western edge of the ranch is 20 cubic feet per second (cfs). This flow value does not include areas that are subirrigated by check structures with no flow rate claimed on the water right. The largest irrigation claim is on Dahl Lake. Historically, the lake was backed up, causing the small valley to flood and, after a short time, the water was released downstream in Pleasant Valley Creek. It is also important to note that the irrigated acreage figure does not include a number of the ranch's natural wetlands (see figure 8). Filing on naturally subirrigated pasture and wetlands was not required under the statute establishing the adjudication. For the last several years, the refuge staff has been monitoring streamflows and pond elevations to understand better the available water. However, it has been very dry during this period.

The Temporary Preliminary Decree for the Fisher River Basin (76C) was issued in 1985. Some of the water rights were not accurately described in the preliminary decree. When the MPC negotiated transfer of the property to the Service, a water rights specialist was retained to review and amend the ranch's water rights. The water rights were verified through field checks and interviews with a number of local water users. The validity of the water rights was documented, but a few errors were found. The clerical errors were corrected with DNRC, but the process of change for the larger issues is still before the water court.

WATER AVAILABILITY

Jerry Cundall managed the property from 1993 to 1999. He says that water availability has not been a problem since he has managed the ranch. His tenure does include at least one dry year, 1994. In addition, the claims filed by the Lost Trail Ranch received no objections from any other users during the adjudication of the basin that occurred in the 1980s, which is an indication that the ranch and general area experience few water conflicts.

The Service is starting a process to predict water availability. Outlined on the topographic maps are three basin drainage areas for the ranch (see figure 8). These three drainage areas are only a presumption of points that might be useful to predict runoff. These drainage areas will be used to predict stream runoff. The closest sites in this drainage that have had USGS continuous stream gauges are Fisher

River at Jennings and Libby. Their drainage sizes are 780 and 838 square miles respectively, or 14–15 times larger than Lost Trail Ranch's drainage area.

Therefore, these sites would be difficult to use to predict what occurs in a small, headwater drainage.

Summary of Water Rights on Lost Trail National Wildlife Refuge, Montana

Source Name	Rate or Storage*	Administrative No.	Appropriation Date
Dahl Lake	0.06 cfs	76CW109542	09/27/1890
Dahl Lake	8.75 cfs/2,911 af	76CW109536	09/27/1890
Dahl Lake	30 gpd/au	76DC109532	09/27/1890
Dahl Lake	3.7 cfs/1,832 af	76CW109540	11/21/1899
Dahl Lake	30 gpd/au	76CW109531	11/21/1899
Pleasant Valley Creek	3.1 cfs/1,031 af	76CW007495	06/29/1886
Pleasant Valley Creek	30 gpd/au	76CW109534	11/16/1901
Pleasant Valley Creek	1.3 cfs/432 af	76CW109537	11/16/1901
Pleasant Valley Creek	3.5 cfs/1,733 af	76CC109538	12/31/1910
Pleasant Valley Creek	321 af	76CB214633	06/30/1949
Pleasant Valley Creek	1,866 af	76CW109541	06/11/1954
Pleasant Valley Creek	220 af	76CG141573	08/31/1956
Pleasant Valley Creek	5 gpm	76CW109544	08/30/1961
Pleasant Valley Creek	585 af	76CW109539	08/30/1961
Pleasant Valley Creek	30 gpd/au	76CW109535	08/30/1961
Pleasant Valley Creek	0.06 cfs	76CW109543	08/30/1961
Pleasant Valley Creek	30 gpd/au	76CW109530	08/12/1964
Pleasant Valley Creek	—	76CP103961	03/03/1998
Well	7 gpm/9.5 af	76CC076531	12/17/1990
Well	12 gpm/4.22 af	76CC076900	01/15/1991

*af=acre-feet

au=animal unit

cfs=cubic feet per second

gpd=gallons per day

gpm=gallon per minute

SPECIES OF CONCERN

Background and biological information is described below for species of concern that may occur within the refuge.

GRIZZLY BEAR

Grizzly bears (*Ursus arctos horribilis*) are a part of America's rich wildlife heritage with an estimated 50,000 grizzly bears inhabiting the western United States prior to European settlement (USFWS 1993). Loss of habitat, livestock depredation control, commercial trapping, unregulated hunting, and protection of human life have eliminated the grizzly bear from all but approximately 2 percent of its historical range in the lower 48 states (USFWS 1993). Today, only 800–1,000 grizzly bears remain in a few fragmented populations in Montana, Idaho, Wyoming, and Washington. Approximately 75 percent of the population of grizzly bears in the lower 48 states occurs in Montana.

Where grizzly bears once roamed throughout the entire Rocky Mountain ecosystem, human settlement and development has fragmented habitat resulting in isolated island populations. Today, there are six distinct recovery areas (ecosystems) in the

conterminous United States. These are areas where grizzly bears were known to reside in 1975 and where adequate space and habitat remains to maintain viable self-sustaining populations. These recovery areas include the northern Cascades in Washington; the Selkirk, the CYE and NCDE in Montana; the Bitterroot in Idaho and Montana; and the Greater Yellowstone in Montana, Wyoming, and Idaho.

The grizzly bear was listed as a threatened species in the lower 48 states under the ESA in 1975 (Federal Register, V.40, No.14, Part IV-3173-4). The Service is mandated by Congress to conserve listed species and the ecosystems upon which they depend. The Revised Grizzly Bear Plan (USFWS 1993) identified actions necessary for the conservation and recovery of the species. Recovery criteria was developed for each recovery zone. The criteria were based on the number of females with cubs observed annually, distribution of family groups within the recovery zone, and a limit on human-caused mortality. The species will be delisted when the populations in all established recovery zones have obtained their goals.

Populations that are dramatically reduced in size and isolated from one another have an increased risk of extinction. Small populations are less able to

absorb losses caused by random environmental, genetic, and demographic changes (Serveen et al. 2001). Linkage zones are areas between separated populations that provide adequate habitat for low densities of individuals to exist and move between isolated populations. The resulting exchange of genetic material helps maintain demographic vigor and diversity, increasing the viability of individual populations. For the grizzly bear, preserving the linkage between populations is as critical to long-term conservation of the species as managing the individual populations.

For recovery and management purposes, all habitats within each of the recovery areas were classified into one of three management situations. Management situation I contains grizzly bear population centers and/or habitat that is needed for the survival and recovery of the species. The needs of grizzlies are given priority. Land uses that affect grizzly bears and their habitat must be compatible with the needs of the species. Management situation II lands are comprised of less suitable habitat where grizzly bears may occur but population centers do not exist. In these areas, the needs of the grizzly bear are weighed against other uses and they will be accommodated when feasible but may not be given the highest priority to the exclusion of other uses. Human–bear conflict minimization will be given high priority. Management situation III contains lands that are unsuitable for grizzly bears such as residential and high recreation areas. Grizzly use of these areas is rare and will be discouraged.

Grizzly Bear Biology

Grizzly bears are a long-lived species of up to 40 years and they exhibit one of the lowest reproductive rates among terrestrial mammals. The limited reproductive capacity prevents a rapid increase in the population. Females first age of breeding is between 3.5 and 8.5 years of age and averages 5.5 years. Breeding occurs on an average of every 3 years after the first litter with from one to four cubs produced. Average litter size is two. Age of first reproduction and litter size varies and may be related to nutritional state (Herrero 1978). Males sexually mature at age 4½. Mating appears to occur from late May through mid-July, peaking in mid-June.

Adult bears lead a solitary existence with social affiliations generally restricted to family groups of mother and offspring, siblings that may stay together for several years after being weaned, and an occasional alliance of subadults or several females and their offspring. Mating season is the only time that adult males and females tolerate one another. The home ranges of adult bears frequently overlap. Home ranges also appear to be smaller while cubs are present, but expand when the cubs are yearlings in order to meet increased foraging demands (Kemp 1972, Pearson 1975, Russell et al. 1978). Home range

sizes vary in relation to food availability, weather conditions, and interactions with other bears.

Humans are the only major cause of mortality to bears both directly and indirectly through habitat destruction. Bears will occasionally kill one another or be killed by other large predators such as wolves. Parasites and diseases are not a significant factor in limiting grizzly bear populations.

Grizzly bears are omnivores consuming both vegetation and animal matter. Vegetation tends to dominate the diet in all areas. However, animal matter (fish, mammals, and insects) can serve as an important supplement to the grizzly bear diet. When bears emerge from their dens in the spring, they tend to forage on immature green vegetation or animal matter. Bears select habitats of specific elevation, aspect, and moisture gradients to obtain these emergent foods. Plants that generally appear early in the growing season, such as grasses, sedges, horsetail, and clover tend to be important foods until more nutritious foods become available. Green vegetation has also been documented as important during late seasons. Selection of vegetation at this time coincides with the use of mesic habitats such as stream bottoms and receding snow-bed communities. Succulent vegetation in these mesic habitats has higher protein content than similar plant species in exposed areas.

The underground roots, corms, and bulbs of foods such as *Herdysarum* spp., *Claytonia* spp., *Erythronium* spp. (glacier lily), *Lomatium* spp. or *Perieridia* spp. (yampah) are also selected at a specific time or in a specific habitat when nutrient quality is high and fiber content is low. Equisetum is selected in all regions of North America and during all seasons. *Heraclium lanatum* (cow parsnip), *Trifolium* spp. and *Taraxacum* spp. are important in the NCDE early and midseason.

Fruit and berries are vital mid- and late-season as they provide bears with an abundant source of sugar prior to denning. During the period of fruit availability, bears must not only gain sufficient weight to survive denning, but must also store energy for the following spring. This is especially true for adult males that tend to forsake spring foraging opportunities to seek and mate with females (Sizemore 1980). In northwestern Montana *Vaccinium* spp. (huckleberry), and *Shepherdia* (buffalo berry) are important natural sources of berries. Overwintering berries of *Arctostaphylos* spp. (bearberry) are also consumed during the spring in some areas (Hamer et al. 1977, Hechtel 1985, Mace and Jonkel 1980) and may have higher sugar content than during the previous autumn (Hamer et al. 1977).

Because it is highly digestible and high in protein, meat is often preferred over vegetal foods. Local

concentrations of large ungulates constitute an important source of protein when available.

Rodents, primarily ground squirrels and microtines may be either a dietary supplement (Hamer et al. 1978, Stelmock 1981, Mace and Jonkel 1980) or may constitute a major protein source prior to denning (Nagy et al. 1983, Hechtel 1985). The restricted availability of animal protein may limit grizzly populations.

The search for food has a prime influence on movement. Upon emergence from the den, grizzly bears seek the lower elevation, drainage bottoms, avalanche chutes, and ungulate winter ranges where their food requirements can be met. Throughout late spring and early summer, they follow plant phenology back to higher elevations. In late summer and fall, there is a transition to fruits and nut sources, as well as herbaceous materials. This is a generalized pattern though and it should be kept in mind that bears are individuals trying to survive and will go where their food requirements are met.

Grizzly bears are occasionally sighted in the Pleasant Valley area. PCTC biologists report that a male grizzly bear resided in the Pleasant Valley–Lost Prairie area in 1994 and 1995. In the fall of 2001, a grizzly bear was observed at Island Lake and Coniff Creek approximately 2 miles from the refuge. The bear was frequently observed in an area being actively logged on PCTC land throughout the fall (Laurie Woods, PCTC Forest Unit Manager, personal communication). According to grizzly bear recovery biologists, the refuge could serve as a linkage area between the NCDE and the CYE.

Livestock grazing can have a significant impact on grizzly bears. In the NCDE, livestock depredation was the most common offense for which a bear was relocated (Thier and Sizemore 1981). Furthermore, these relocations were much less successful than relocations for other offenses (success being no return and no further conflict). Knight et al. (1985) reported that depredations (livestock and property) were the leading cause of nonhunting mortality in the NCDE from 1975 to 1984. Unreported grizzly bear mortality related to livestock operations may be a significant part of the overall mortality. Jorgensen (1979) reported that only 41 percent and 17 percent of known bear kills in 1976 and 1977, respectively, were ever reported.

Several studies have addressed the question of whether grizzly bears can coexist with livestock without depredation. Knight and Judd (1983) reported that all radio-tracked bears (except one orphaned cub) that came into contact with sheep killed them. However, Claar et al. (1999) found that only 2 out of 20 marked grizzly bears in the Mission Mountains (NCDE) were involved in sheep depredations although almost all were in proximity to livestock during spring and fall. Several

investigations observed that depredation behavior was apparently a learned process (Johnson and Griffel 1982, Jorgensen 1983, Knight and Judd 1983). Regional differences in depredation may be related to learned behavior and previous levels of control on depredating bears (Johnson and Griffel 1982).

Livestock can also affect grizzly bears through direct competition for early spring browse and by degradation of quality habitat by trampling and grazing. Livestock grazing can affect bears by displacing them off quality habitat as they avoid areas of human activity.

Recreational activities can directly or indirectly affect the survival of grizzly bears. Grizzly bears can be directly taken in the defense of human life and through mistaken identity during black bear hunting seasons. In the Swan Range in northwestern Montana, out of 19 known human-caused grizzly bear deaths, mistaken identity was the cause of 6 deaths and self defense was the cause 3 deaths. Indirectly, recreationists can displace bears off quality habitat onto less desirable habitat. This may result in reduced reproduction by displaced bears, higher mortality rates due to food stress or lower security, and smaller bear populations due to reduced carrying capacity of remaining habitat (Serveen et al. 2001).

Conversely, grizzlies may become habituated to humans. Habituation generally leads to mortality of the bear as these bears are more likely to come in conflict with humans, are more vulnerable to hunters and poachers, and have an increased chance of becoming involved in a collision with a motor vehicle (Claar et al. 1999). The greatest impact of roads on grizzly bears is an increase in human access into grizzly habitat. Bears react differently to roads depending on habituation and security cover. Roads bring people into contact with bears, may cause bears to avoid habitats, or may habituate bears to humans.

Habitat fragmentation is usually accompanied by habitat loss, increased disturbance and increased human–wildlife conflicts. The primary causes of fragmentation in grizzly habitat are human activities such as road building and residential, recreational, and commercial development.

The grizzly bear has an increased risk of extinction because the population consists of a limited number of individuals that live in several distinct populations geographically isolated from one another. Small populations are less able to absorb losses caused by random environmental, genetic, and demographic changes (Serveen et al. 2001).

Linkage zones are areas between separated populations that provide adequate habitat for low densities of individuals to exist and move between isolated populations. The resulting exchange of

genetic material helps maintain demographic vigor and diversity, increasing the viability of individual populations.

Gaining support and confidence of people who live in or near grizzly habitat is one of the greatest challenges to grizzly bear recovery. Efforts that address the attitudes and concerns of the local public serve to foster tolerance and positive attitudes toward grizzly bears in communities throughout grizzly bear habitat. These efforts include intensive education programs, proactive livestock and garbage management projects that reduce bear attractants on private land, and the maintenance of personal contact between citizens and state and federal wildlife biologists who live and work together in local communities and rural areas near grizzly habitat.

GRAY WOLF

Prior to European settlement, the gray wolf existed across most of North America. Early settlers perceived the gray wolf as a threat to human life and property, especially livestock. Wolves also competed for deer and elk upon which many early settlers were dependant for food. By the 1930s, poisoning, trapping and shooting, spurred in part by government bounties, extirpated the gray wolf from 95 percent of its range in the conterminous United States. Gray wolf populations were eliminated from Montana, Idaho, and Wyoming, as well as adjacent southwestern Canada.

After human-caused mortality of wolves in southwestern Canada began to be regulated in the 1960s, the population began expanding southward (Carbyn 1983). Dispersing individuals occasionally reached the northern Rocky Mountains of the United States (Ream and Mattson 1982, Nowak 1983), but were not protected and soon disappeared. The ESA of 1973 provided the needed protection and recolonization became possible.

In 1986, wolves which had migrated from Canada successfully raised a litter of pups in Glacier National Park, Montana, and a small population was soon established (Ream et al. 1991). The third pack of wolves to naturally recolonize into Montana from Canada formed in Pleasant Valley in 1988. The wolves denned on private land within ¼ mile of what is now the refuge. In 1989, there were three adults and three pups in the pack. Unfortunately, they started to prey on livestock and were controlled both lethally and through relocation.

A second pack formed in 1996 in Pleasant Valley and had pups again in 1997 and 1998. Once again, they started to prey on livestock and were removed in 1999. All control actions were either carried out prior to the establishment of the refuge or conducted off the refuge after establishment. After the removal of the Pleasant Valley Pack in 1999, the “Little Wolf

Pack” moved down from the north and began killing cattle in the Pleasant Valley area. Four wolves from the “Little Wolf Pack” were killed in two control actions in 2000.

In 1998, the Lost Trail Ranch was purchased by the MPC and eventually became Lost Trail National Wildlife Refuge. At the same time, the NRCS, working with neighboring landowners, purchased WRP easements on 5,765 acres of former grazing lands. The formation of the refuge and the purchase of these WRP easements will greatly reduce the number of cattle being grazed in this area and should decrease wolf–livestock conflicts.

Much controversy has surrounded wolf recovery in Montana and throughout the northern Rockies. Although wolves primarily feed on deer and elk, they will occasionally prey on livestock. Once a wolf has identified livestock as a source of food, it may continue to prey on livestock and teach other wolves in the pack to do the same. A private program compensates ranchers fair-market-value for confirmed losses and about one-half fair market value for probable wolf kills of livestock and livestock guard animals. However, livestock carcasses are often eaten or decomposed when located, making it difficult to confirm wolf depredation. On open range, carcasses may never be found, resulting in actual losses much higher than what can be confirmed.

Sometimes livestock producers who have confirmed livestock losses caused by wolves may also discover some other livestock missing after the fall roundup. This leads ranchers to infer that wolves were responsible for the missing livestock even if there are no signs of depredation. This perceived human–wildlife conflict creates a climate of mistrust for the Service’s mandate to protect and recover wolves.

The Service strives to maintain good relations with adjacent landowners, including coordination efforts and addressing the concerns of private property owners. These efforts are geared towards the recovery and conservation of this listed species as required by the ESA. The refuge is part of the historical range of the gray wolf and is geographically situated between areas designated for recovery. Thus, this refuge is in a position to contribute to the overall recovery and maintenance of this species by acting as a corridor or as a possible site for wolf recolonization.

On April 1, 2003, the Service issued “take” regulations under section 4d of the ESA detailing the context and designated personnel that may take gray wolves. These regulations replaced those found in the 1999 control plan. Some of the reasons why a gray wolf may be lethally taken include scientific research, protecting human safety, and proven depredation of domestic cattle. In this last case, before any wolf control action is initiated, an

investigation must be conducted to confirm that a depredation has occurred and that wolves were indeed responsible for the depredation.

Wolves may not necessarily be determined problem wolves if depredations occur on livestock that are lawfully present on federal lands or in areas or at times, which are critically important to wolves. Under such conditions, control of wolves will occur only if all other options for resolution of the conflict have been exhausted. This criterion applies only to the refuge and other federal lands in northwestern Montana. Areas or habitat components important to wolves include areas within 1 mile of known or highly suspected wolf dens or rendezvous sites from March 15 to July 1, ungulate calving/fawning areas from May 1 to July 1, and ungulate winter ranges from December 1 to April 15 (USFWS 1999c). Refuge personnel would apply these conservation measures.

Most of the controversy surrounding wolf conservation revolves around wolves that feed on domestic cattle and sheep. It is the Service's intention to manage wolves in northwestern Montana in a way that allows nondepredating wolves to be the "building blocks" of the population. Nondepredating wolves should cause little or no conflict with humans. It is these animals that the Service intends to build its recovery program around. Animals that habitually depredate on livestock are not desirable for use in establishing or bolstering wolf populations. Therefore, wolves that are chronic problem wolves and direct their hunting behavior toward livestock will be removed from the population. While already recovered in this area, the recovery plan indicates that, if necessary, the state of Montana and the Service may use lethal control methods to stop depredations. No control efforts will be conducted on the refuge; however, problem wolves may den on the refuge or seek refuge there and be taken when on private land.

The recovery plan for the wolf in the northern Rockies of the United States (USFWS 1987) identified northwestern Montana, central Idaho, and the Greater Yellowstone Area (GYA) as recovery areas. The biological goal for delisting is greater than or equal to 10 breeding pairs of wolves in each of these three areas for 3 consecutive years.

Monitoring data indicates that this goal was attained in 2000 with 30 breeding pairs of wolves successfully raising two or more young to December 2000. Preliminary data indicates that at least 30 breeding pairs were also successful in 2001. Thus, if 30 breeding pairs are again documented in December 2002, the Service could propose to delist wolves from the ESA. Wolves cannot be removed from federal protection until the states in which they reside develop approved conservation and management plans. The state of Montana drafted a conservation and management plan in January of 2002. This

document has been submitted for review and can be obtained from MFWP.

Gray Wolf Biology

Wolves are social animals, normally living in packs of 2–10 members. Packs are primarily family groups consisting of a breeding pair, their pups from the current year, offspring from the previous year, and occasionally an unrelated wolf.

Packs occupy and defend from other packs and individual wolves a territory of 20–210 square miles. In the northern Rocky Mountains, territories tend to be larger, typically 200–400 square miles. Normally only the top-ranking male and female in each pack breed and produce pups.

Litters are born from early April into May and can consist of 1–11 pups, but generally consist of 4–6 pups. In late April until September, pups are moved to rendezvous sites where they remain while the adults hunt and return with food. Rendezvous sites are located in meadows or forest openings generally near the den, but they can be several miles away. Pups travel and hunt with the pack by September. Yearling wolves frequently disperse from their natal packs. Dispersers may become nomadic and cover large areas as lone animals, or they may locate suitable unoccupied habitat and a member of the opposite sex and begin their own territorial pack.

When the wolf recovery plan was written, it was believed that wolves would occupy higher elevation public lands far from the presence of humans (Fritts et al. in press). However, wolves demonstrated a much greater tolerance of human activity than anticipated. While some packs have established territories in protected areas such as national parks and wilderness, most prefer lower elevations where prey is more abundant (Boyd-Heger 1997).

Several studies on wolf and their prey have been initiated since the wolf recovery plan has been in place. Wolves in the GYA are preying primarily on elk (90 percent of all wolf kills) (Smith et al. 2000), and kill rates are slightly higher (12–15 ungulates/wolf/year) than predicted (12 ungulates/wolf/year) in the EIS. In the Gros Ventre River drainage in Wyoming, of 51 located kills, 48 were elk, 2 were coyotes, and 1 was a beaver. In a study west of Salmon, Idaho, elk was again the preferred prey with a kill on average every 3.45–4.98 days.

Researchers believe these kill rates may be underestimated due to loss of contact with the pack for various lengths of time. Studies in the River of No Return Wilderness in central Idaho also indicated elk as the primary prey followed by mule deer (Mack and Laudon 1998). In the north fork of the Flathead River drainage, white-tailed deer comprised 87 percent of the wolf kills examined from 1992 to 1995 (Kunkel et al. 1999). Researchers concluded that ungulate species compose different

proportions of wolf diets, depending on the relative abundance and distribution of available prey within the territory. Wolves will also prey on smaller species such as rabbits and ground squirrels, as well as on carrion, vegetation, and insects. Wolves may also kill and feed on domestic livestock such as cattle, horses, and sheep.

There are no wild animals that habitually prey on gray wolves. Occasionally wolves will be killed by large prey such as deer or moose or by a competing predator such as a mountain lion. Other wolves are the largest cause of natural predation among wolves. Other causes of natural mortality include old age, disease, starvation or accidents. In northwestern Montana, natural mortality probably does not regulate populations (USFWS 2001).

Humans are the largest cause of wolf mortality and the only cause that can significantly affect populations at recovery levels (USFWS 2001). Human-caused mortality consists of authorized control actions, legal killing in defense of life or property, illegal killing and car/train collisions. Control actions accounted for most human-caused mortalities in Montana.

In the studies of wolves in Montana, Idaho, and Wyoming to date, disease and parasites have not appeared to be a significant factor affecting wolf population dynamics. Just like wolves in all other parts of North America, wolves in the northern Rocky Mountains will occasionally die from a wide variety of canid diseases. However, it is doubtful that wolf populations in the northern Rocky Mountains would be significantly impacted, because wolf exposure to these diseases has been occurring for decades.

A demonstration of the importance of an abundant natural prey base to wolf survival can be found in the examination of wolf-prey relationships in northwestern Montana. White-tailed deer populations started to increase in the 1970s and remained high until the winter of 1996–97. Wolf numbers and distribution also expanded during this period. Record hunter harvest in the fall of 1996 followed by one of the most severe winters on record significantly decreased ungulate populations. This was followed by a corresponding increase in wolf depredation on livestock and subsequent wolf control. Conflicts between wolves and livestock during 1997 represented nearly 50 percent of all confirmed livestock depredations and lethal wolf control in northwestern Montana since 1987 (Bangs et al. 1998).

Evaluation of wolf management in the northern Rocky Mountains has shown that successful wolf recovery does not depend upon land use restrictions on private land due to the wolves' ability to thrive in a variety of land uses. There is little, if any, need for land use restrictions to protect wolves in most

situations, with the possible exception of temporary restrictions around active den sites on federal lands. Additionally, the public is much more tolerant of wolf recolonization if the presence of wolves does not result in restrictive government regulations.

There are nonlethal management techniques to discourage wolves from preying on livestock (e.g., electronic training collars). However, none of the techniques tested to date has proven 100 percent effective and none of the existing techniques has worked for extended periods.

Hunting success and regulations for large ungulates are directly related to prey populations. One of the greatest concerns the public had with wolf reintroduction was the effect that wolves would have on deer, elk and moose populations (USFWS 2001). Thus, human attitudes and tolerance, which vary widely across different stakeholders, is probably the most important factor to long-term gray wolf survival and conservation (Sime 2002).

CANADA LYNX

The Canada lynx (*Lynx canadensis*) was listed as a threatened species in the contiguous United States under the ESA in 2000. According to the Service, the factor threatening the lynx in the contiguous United States is the lack of guidance to conserve lynx and its habitat in federal land management plans.

Lynx inhabit marginally suitable habitat in the contiguous United States that decreases in quality and availability the further south the habitat occurs. Historical reports from western Montana indicate that lynx were numerous in recent times. MFWP records indicate trappers statewide took 990 lynx from 1959 to 1967 (Hoffman et al. 1969). Since 1977, Montana's largest lynx harvest was 62 lynx trapped in 1979 and again in 1984 (McKelvey et al. 1999, Giddings 1995). Quotas were established in 1982 and lynx trapping was closed in Montana in 1999. Lynx are most common in the northwestern areas of the state.

Canada Lynx Biology

Snowshoe hare are the primary food of lynx comprising from 35 to 97 percent of their diet throughout the year (McCord and Cardoza 1984). Lynx also feed on mice, squirrels, grouse and ptarmigan, especially during the summer months (McCord and Cardoza 1984). There have been several observations of lynx hunting Columbian ground squirrels including a report by Barash (1971) of two adult and one juvenile lynx cooperatively hunting ground squirrels in Glacier National Park.

Lynx habitat is composed of Englemann spruce (*P. englemannii*), subalpine fir (*Abies lasiocarpa*), lodgepole pine (*Pinus contorta*) and aspen forests (*Populus tremuloides*) above 1,400 meters. In the

western mountains, the management of habitat for snowshoe hares is an important component of lynx conservation efforts due to the relatively low hare densities in boreal forest habitats of western mountains, and because of the importance of hare availability for successful lynx reproduction.

Snowshoe hare habitat consists of coniferous forests with dense understory (Berrie 1973, Koehler 1990, Ruggiero et al. 1999). These conditions are usually found in early successional stands with high stem densities. For denning, lynx require mature forests that contain large woody debris such as fallen trees or upturned stumps. Thus, high quality lynx habitat in the western mountains consists of a mosaic of early successional habitats with high hare densities, and late-successional stands with downed woody debris for thermal and security cover for denning.

The refuge contains only marginally suitable Canada lynx habitat. Northwestern Montana is at the southern range of the lynx and thus lynx only exists at the highest elevations. Lynx in Montana are generally found in forest communities between 1,200 and 2,100 meters. Douglas-fir, western larch, and lodgepole pine dominate on lower elevations with subalpine fir, whitebark pine, and Engelmann spruce at higher elevations. Maximum elevation on the refuge is 1,280 meters and only 4,121 acres of forest habitat exists. Further, open grasslands across the valley floor are a barrier to lynx movement across the refuge. Snowshoe hare populations are unknown for the refuge, but hares have frequently been observed in forested areas of the refuge and surrounding PCTC lands.

Canada lynx are specialized predators adapted to northern latitude and high elevation habitats with abundant winter snows. Conclusions from the "Ecology and conservation of lynx in the United States" (Ruggiero et al. 1999), are that a snowshoe hare density greater than 0.5 hares/hectare is required for lynx.

BALD EAGLE

Historically, bald eagles were present across North America from Alaska and Canada south to northern Mexico. Persecution of bald eagles and golden eagles in livestock producing areas of the west prompted passage of the Bald Eagle Protection Act of 1940 (16 U.S.C. 668). Further protection was afforded in 1972 with inclusion of raptors under the Migratory Bird Treaty Act (16 U.S.C. 703, 1918). The effects of the pesticide DDT decimated populations during the 1960s and, by the early 1970s, bald eagle breeding range was limited to remote forested areas. DDT was banned in 1973 and bald eagle populations started to recover. Because of severe population declines induced by pesticide residues, the northern subspecies of the bald eagle was afforded protection under the ESA in 1978.

The bald eagle was classified as endangered in Montana in 1978. The ESA of 1973 mandated the formation of regional recovery teams charged with preparation of plans that outline specific conservation and management actions to achieve and maintain recovery of endangered species in specific recovery areas. Montana includes seven recovery zones (in the Pacific States recovery area) (MBEWG 1994b).

Surveys indicate that the population of nesting bald eagles in Montana is increasing. From 1978 to 1995, the number of breeding pairs increased from 12 to 166, surpassing the recovery goal of 99 breeding pairs cited in the 1986 Bald Eagle Recovery Plan. As of July 1994, Montana contained the seventh largest breeding bald eagle population and largest concentration of autumn migrants in the lower 48 conterminous states. On July 12, 1995, the bald eagle was reclassified from endangered to threatened in Montana (MFWP 2002).

The management goal for Montana is to facilitate population growth until the number of viable bald eagle breeding areas peaks. Thereafter, the goal is to provide secure habitat for bald eagles to maintain a viable, healthy, self-sustaining population as close to peak level as possible in perpetuity (MBEWG 1994b).

Within the context of the management goal, the habitat objective is to provide sufficient habitat to maintain peak numbers of viable bald eagle breeding areas in Montana. The population objective is to maintain at least 68 percent of the peak number of viable breeding areas as active (MBEWG 1994b).

Bald Eagle Biology

Bald eagles are associated with aquatic environments although they may forage in uplands. Bald eagles are opportunistic with prey consisting of fish, ground squirrels, waterfowl, carrion, and rabbits (Snow 1973, Todd et al. 1982, Stalmaster 1987, Watson et al. 1991, Mersmann et al. 1992).

In Montana, bald eagles typically nest within one mile of the shore of lakes larger than 80 acres or major rivers. Nest sites are generally in older trees of large diameter in stands greater than three acres (MBEWG 1994b).

Bald eagles can be sensitive to human disturbances such as recreation, research, and development. Response varies from temporary avoidance of an area to total reproductive failure and abandonment of the breeding site. Bald eagles can also tolerate what appear to be significant disturbances. Relationships of human activity and eagle responses are highly complex, difficult to quantify, and often site specific. Responses vary depending on type, intensity, duration, timing, predictability, and location of the human activity. Some bald eagles are more tolerant of human activity than others are.

Tolerance threshold is usually site, pair, and activity specific and a function of type, intensity, and proximity of disturbance over time (MBEWG 1994b).

A pair of bald eagles has nested in an aspen stand on the north shore of Dahl Lake since 1995. This pair has fledged average of two young per year. The eagle nest was blown out of the tree in a severe windstorm during the summer of 2000. Two adult eagles constructed a nest in the same vicinity in 2001 but no young were produced.

Bald eagles are highly sensitive to disturbance from the nest building stage until hatching. After hatching, eagles are less sensitive to disturbance and are less likely to abandon or neglect young.

The management goal for Montana is to facilitate population growth until the number of breeding pairs peaks. After that, the management goal is to provide secure habitat to maintain a healthy self-sustaining population as close to peak levels as possible (MBEWG 1994b).

TRUMPETER SWAN

The trumpeter swan is considered a threatened species and of special concern by MPIF (Casey 2000). Although this species was petitioned to be listed under the ESA, the Service determined the petition did not contain substantial information.

Trumpeter swans were once common in the United States but were decimated by commercial harvest for feathers and skins and by loss of habitat. A small population of swans managed to survive in the tri-state area of Montana, Wyoming, and Idaho due to the areas remoteness and geothermal activity that kept water open over the winter months. In 1935 only 69 trumpeter swans were known to exist; however, it was later discovered that unrecorded flocks also inhabited parts of Alaska and Canada. Although populations have increased, the trumpeter swan is still at risk from continued loss of wintering habitat, over population and concentration of swans on remaining wintering areas, and lack of migration in several wild and restored flocks (Mitchell 1994).

A priority of the Service's Trumpeter Swan Working Group is to restore nesting trumpeter swans to unoccupied historic breeding habitat and encourage broader winter distribution. Winter habitat seems to be the limiting factor for the United States portion of the Rocky Mountain population (RMP). A congregation of approximately 30 percent of the population in a small area at Harriman State Park and large congregations at Red Rock Lakes National Wildlife Refuge and other wintering areas within the tri-state area leave the trumpeters vulnerable to disease. (Federal Register/Vol. 55, No. 81/Thursday, April 26, 1990/Proposed Rules).

The Service recognizes the need to continue to expand winter range of the RMP trumpeter swans.

It also indicated there was a need to maintain viable segments, or subpopulations, of the RMP in order to expand the species to where it is sufficiently widespread that a catastrophic event in any one part of the population's range will not threaten the existence of the population. With new breeding areas occupied, new migratory paths may be established. The "pioneering spirit" results in young traveling to and from specific breeding and wintering areas with their parents, which may foster a wintering migratory path different from into the tri-state management area, where there have been problems with lack of adequate wintering habitat.

Trumpeter Swan Biology

Trumpeter swan habitat needs are not well defined, but suggest shallow interconnected wetland complexes, irregular shorelines, and water depths of less than 1.2 meters with dense stands of emergent vegetation. Swans need muskrat mounds, abandoned beaver lodges, or sedge hummocks for nest sites. (Casey 2000)

Preferred forage species listed under the Targee National Forest Plan (1997) include sego pondweed (*Potamogeton rectinatis*) and waterweed (*Elodea canadensis*). However, trumpeters readily adapt to new food sources and virtually all available species are consumed. In Yellowstone, dominant food consisted of *Chara* spp., *Elodea canadensis*, and *Potamogeton* spp. (Squires and Anderson 1997). Cygnets feed mainly on aquatic insects and invertebrates from 2 to 5 weeks of age (Mitchell 1994). This protein rich food source is important to the cygnets' rapid growth.

The Wisconsin Department of Natural Resources developed a habitat suitability index for trumpeter swans during restoration efforts in the state. Criteria developed for trumpeter swan restoration to an area included: abundant and diverse submergent and emergent aquatic plant food (especially *Elodea*, *Sagittaria*, *Najas*, *Nitella*, *Potamogeton*, *Zizania*, *Sparganium*); presence of shrubby or emergent plants suitable for escape cover; loafing sites; absence of utility lines along potential flight paths; minimal waterfowl-hunting history during years when lead shot was legal; and limited access and minimal uncontrolled human use. Breeding habitat required suitable nesting substrate, especially rich submergent and emergent food supply, and more escape cover, more isolation from human contact, and more protected shallow water and shoreline feeding areas (for broods) than nonbreeding sites, which could include more open water.

The only trumpeter swans that have been recently documented in the Pleasant Valley area are two swans that attempted to nest at Island Lake. They were observed throughout the summer by a neighboring landowner.

Trumpeter swans are long-lived, social birds that are highly dependant upon strong family bonds and traditional patterns of habitat use that are passed down through generations (USFWS 1995a). Severe losses could occur from disease outbreaks, severe winter weather, and lack of forage. In 1989, more than 100 swans died in the tri-state area when a blizzard swept through a major wintering area. Since then winters have been mild, but the possibility of another hard winter always exists.

As the swan population increases, the limited resources in the area are taxed and may not recover to provide forage for the next year. It is important to the survival of the RMP to relearn and rebuild migratory patterns that were lost when swans were exterminated from much of their range. The ultimate goal is to reacquaint trumpeter swans with wintering grounds, breeding areas, and migratory routes that were lost when the population neared extinction in the early 1900s. This will be accomplished through natural pioneering and through transplant of swans to suitable habitat.

Nesting trumpeter swans have been shown to be sensitive to human disturbance during the nesting season. Birdwatching, photography, research, and other activities in or near nesting areas may cause nest failure or cygnet loss by disturbing adults (Mitchell 1994). In Yellowstone National Park, human intrusion was the most significant known cause of egg failure in trumpeter nests (Banko 1960).

Important requirements for successful breeding of trumpeter swans includes: room for take off (approximately 100 meters); accessible forage; shallow, stable levels of unpolluted, fresh water; emergent vegetation, muskrat island, or other structure for nest site; low human disturbance, highly irregular shorelines; water depth of less than 1.2 meters; abundant and diverse communities of aquatic plants; and abundant invertebrate populations (Mitchell 1994, Hansen et al. 1971, Maj 1983, Squires 1991, Lockman et al. 1987).

BLACK TERN

Black terns are listed as a Service nongame bird of management concern (USFWS 1995b). They were listed as a candidate 2 species for review under the ESA, however they were removed from ESA consideration when the category 2 list was discontinued. Statewide they are listed as a species of special concern with a ranking of vulnerable under the Natural Heritage Program classification system (Shuford 1999). Black tern populations have been declining since the 1960s across North America. Declines are thought to be related to a loss of wetlands, and a decrease in food supply caused by insect control and over fishing in the winter range (Dunn and Agro 1995).

Dahl Lake was surveyed for black tern by MFWP in 1999. Approximately 50–60 adults were observed. Nesting was confirmed by the presence of juveniles. Nests were located in Alkali bulrush (Ryan Rauscher, MFWP, personal communication).

Black Tern Biology

Black terns nest in biologically rich shallow freshwater marshes with abundant emergent vegetation. They prefer marshes or marsh complexes comprised of semipermanent ponds greater than 20 hectares in size. Ponds can be located in open or forested country up to 1,540 meters in elevation (Dunn and Agro 1995, Shuford 1999). Black terns feed on insects and fresh water fishes.

Black terns arrive on the breeding grounds mid- to late May initiating nesting in late May or early June. Most hatching is completed by late June or early July, with fledging occurring mid- to late July. Black terns leave the breeding grounds for foraging sites by early August.

Black terns are semicolonial nesters. Generally, nests are located in still water from 25 to 134 centimeters deep in marshes with from 25 to 75 percent emergent vegetation (Gould 1974, Stern 1987, Shuford 1999). Nest site selection is correlated more to the density of emergent vegetation than to the type of plant or water depth. Vegetation is not usually so dense as to prevent a canoe from being forced through it (Dunn and Agro 1995).

Nests are built on floating substrate comprised of matted dead marsh vegetation, detached root masses, boards, or muskrat-built feeding platforms of fresh-cut vegetation. Occasionally nests are located on nonfloating material such as muskrat lodges, small mud patches of rooted but flattened vegetation, or abandoned nests of other marsh birds. (Dunn and Agro 1995). Nests are often flimsy, and are easily destroyed by wind or changing water levels. If the nest is destroyed, renesting may occur at the same site or at another site up to 42 kilometers away.

Predominant emergent vegetation is usually cattails (*Typha* spp.), bulrush (*Scirpus* spp.), or less often burreed (*Sparganium* spp). Nests have also been located in sedge (*Carex* spp.), reed canarygrass (*Phalaris arundinacea*), marsh horsetail (*Equisetum fluviatile*), rushes (*Juncus* spp.) hairgrass (*Deschampsia* spp.), and spatterdock (*Nuphar* spp.). Emergent vegetation is <0.25–0.5 meter high when the nests are initiated and often grows to 1 meter before hatching occurs. Snags and posts are used for copulation, resting, and feeding fledglings (Dunn and Agro 1995).

Black terns nest in shallow, freshwater wetlands in emergent vegetation. They prefer wetland complexes greater than 20 hectares, in areas with

25–75 percent surface covered with emergent vegetation, water depths between 0.5 and 1.2 meters, and nesting substrate within 0.52 meters of open water (Dunn and Agro 1995). Nests are often lost to bad weather, effects of winds and waves and changing water levels. Known predators include great horned owl, mink, northern harrier, ring-billed gull, American crow, common raven, raccoon, muskrat, long-tailed weasel, otter, and snapping turtle (Gerson 1988, Novak 1992, Dunn and Agro 1995). Nest success will be monitored to document production.

Degradation of lake habitat may occur by succession, raising or lowering water levels, introducing exotic species, and reductions in water quality (Novak 1992). Nest platforms can be flooded out by rising water levels. Low water levels may increase likelihood of nest predation by mammals. Black terns may shift breeding sites from year to year in response to changes in hydrologic cycles and emergent vegetation (Shuford 1999). In most cases, WPA managers can provide suitable nesting habitat for black terns without any major changes to their water management (Casey 2000).

SPALDING'S CATCHFLY

Spalding's catchfly (*Silene spaldingii*) is a long-lived perennial herb that reproduces by seed only. It is a natural component of native Palouse prairie from 1,750 to 5,100 feet in elevation. Palouse prairie has been reduced by 98 percent of its historic levels due to conversion to crop, hay and pasture land, and urbanization.

Today, there are only 53 known populations of Spalding's catchfly located in remnant Palouse prairie habitat in Washington, Idaho, Oregon, and Montana. Nine of these populations are located in western Montana (Flathead, Lincoln, Sanders, and Lake counties). Threats to these remaining populations include continued habitat destruction and fragmentation, grazing and trampling by domestic livestock and native herbivores, herbicide treatment, competition from nonnative plants, altered fire regimes, and competition for pollinators.

Grazing affects Spalding's catchfly directly through trampling and consumption of seed heads and indirectly by altering species composition of available habitat. Soil disturbance associated with grazing gives biennial plants and nonnatives that are adapted to disturbance a competitive advantage over Spalding's catchfly (Benner 1995). If grazing is heavy enough, Spalding's catchfly will likely disappear from an area. Grazing of inflorescence by livestock and native herbivores has been observed and is considered a significant threat to the species (Federal Register/Vol. 66 No. 196. 50 CFR 17 RIN 1018AF79 10/02). Grazing by rodents has also been found to be significant factor influencing the survival of Spalding's catchfly. In eastern Washington, plants

that were marked as part of a monitoring project were found broken or missing when examined at a latter date. Damage was attributed to rodents (Benner 1999).

Spalding's catchfly is predominantly found at sites free of nonnative plant species. Nonnative invasive plant species such as St. John's-wort (*Hypericum perforatum*), Yellow starthistle, Canada Thistle (*Cirsium arvense*), sulfur cinquefoil (*Potentilla recta*), and cheatgrass (*Bromus tectorum*) outcompete Spalding's catchfly for water, nutrients, light, and pollinators. At one site in Montana, the number of plants decreased from 30 in 1983 to only 11 in 1990 after an invasion of spotted knapweed. The survival of Spalding's catchfly is further threatened by efforts to control nonnative invasive plant species. Chemicals used to control most invasive plants will also kill catchfly plants.

Spalding's catchfly requires a pollinator such as the bumblebee (*Bombus fervidus*) to reproduce successfully. When other flowers such as St. John's-wort are abundant in a habitat where catchfly is also present completion for the limited number or pollinators may adversely affect the fecundity of the plant. Conversely, in areas where Palouse prairie has been converted to agricultural production, pollinators such as the bumblebee may not be present because of the scarcity of flowering plants in the area. The presence of pollinators is considered critical for the persistence of Spalding's catchfly (Federal Register/Vol. 66 No. 196. 50 CFR 17 RIN 1018AF79 10/02). Populations of Spalding's catchfly that occupy small areas surrounded by cropland that does not support bumblebees are not likely to persist over the long term (Federal Register/Vol. 66 No. 196. 50 CFR 17 RIN 1018AF79 10/02).

Spalding's catchfly populations have also been influenced by traditional fire suppression philosophies that have promoted an increase in woody vegetation and the build up of litter and duff. Competition from woody plants often reduces the recruitment of native prairie species (Menges 1995).

Spalding's catchfly is found in mesic sites that are neither extremely wet nor extremely dry. Flowers are produced from mid- to late July which is after most other forbs in these habitats are finished flowering.

Threats to Spalding's catchfly that may occur on the refuge include, grazing and trampling by domestic livestock and native herbivores, herbicide treatment, competition from nonnative plants, and competition for pollinators. Prescribed fire may have a positive effect on Spalding's catchfly by removing litter or duff layers and woody plants, improving natural propagation of the plant. Recruitment of Spalding's catchfly was enhanced following prescribed fire in Montana (Lesica 1992, 1999). The effects of fire will vary depending on fuel moisture, species

composition, season, and intensity of burning (Lesica 1997). Prescribed fire may also increase invasive nonnative plant populations, which may negatively affect Spalding's catchfly. Therefore, prescribed fire may enhance catchfly survival and recruitment but must be thoroughly evaluated prior to use.

Invasive plants displace the plant and compete with it for water, nutrients, light, and pollinators (Lesica and Heidel 1996 in Delphey and Rey-Zizgirdas 2001; Montana Natural Heritage Program 1998). Many locations of catchfly on the refuge are at risk of being displaced by nearby populations of invasive plants, especially spotted knapweed and sulfur cinquefoil. Herbicide use to control nonnative plants may also harm Spalding's catchfly. An integrated pest management program should be evaluated including hand pulling, hand spraying, and biological control to reduce encroaching invasive plants while not harming the catchfly.

Management tools such as prescribed fire and federal control will benefit the catchfly as long as careful attention is given to their implementation. Management tools such as grazing, prescribed fire, and spraying may adversely affect Spalding's catchfly populations, even though they could also be critical to its continued existence. A burning program at the wrong time of year or in an area subject to more invasive plant encroachment could create a disadvantage for the catchfly.

Invasive plant control alone is important due to invasive plants displacing and in competition with the catchfly (Lesica and Heidel 1996, Montana Natural Heritage Program 1998). However, herbicide application has to be carefully applied at the right time of year and not in the location of plants to not damage the catchfly. Federal law

prohibits modification of critical habitat, and any act that may jeopardize the continued existence of a listed species.

Prior to implementation of any management actions that may affect Spalding's catchfly, a survey must be conducted to determine if this species is in the management area. If the species is located, refuge staff will evaluate the effect that implementing the management action would have on the plant and develop the best management practice.

CULTURAL RESOURCES

According to the National Historical Preservation Act, the historical and cultural foundation of the Nation should be preserved as a living part of community life and development to give a sense of orientation to the American people.

The Archaeological Resources Protection Act requires the land-managing agencies to establish public awareness programs regarding the value of archaeological resources to the Nation; however, cultural sites are sensitive, and allowing uncontrolled access by the public to them is unacceptable. These resources are increasingly endangered because of their commercial attractiveness and education is a way to encourage compliance with rules and regulations and increase protection.

In accordance with Executive Order No. 13006, issued May 21, 1996 (61 Fed. Reg. 26071), federal agencies shall, prior to acquiring, constructing, or leasing buildings for purposes of carrying out agency responsibilities, use historic properties available.

Appendix B—Draft Compatibility Determinations

The below information and rationale was used to determine the type and level of public use that would be compatible with the purposes of the Lost Trail National Wildlife Refuge.

PUBLIC USE

Detailed descriptions of the public use activities that would be allowed on the refuge (below) are stated in alternative A of the environmental assessment for the CCP for Lost Trail National Wildlife Refuge.

- Wildlife observation and photography throughout refuge including use of scenic drive, wildlife-viewing areas, and nature trails.
- Recreational hunting of deer, elk, mountain grouse, and turkey in accordance with state of Montana regulations.
- One recreational fishing event per year for youth, in accordance with state of Montana regulations.
- Wildlife-dependent environmental education and interpretation activities with on-site field trips, day use area, and accessible campground for overnight use by educational groups.

REFUGE ESTABLISHMENT

Lost Trail National Wildlife Refuge was established in August 1999. The purposes of the refuge are described in the following establishment and acquisition authorities:

- Migratory Bird Conservation Act (16 U.S.C. 715-751r)
...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.
- Fish and Wildlife Conservation Act [16 U.S.C. 661(1)-662(c)]
...for the conservation and enhancement of fish and wildlife.

REFUGE GUIDANCE

As part of the National Wildlife Refuge System, the management and use of Lost Trail National Wildlife Refuge is guided by various federal laws and guidance.

Laws, Regulations, and Policy

- National Wildlife Refuge System Improvement Act of 1997
- National Wildlife Refuge System Administration Act of 1966
- Refuge Recreation Act of 1962
- Code of Federal Regulations, Title 50
- U.S. Fish and Wildlife Service Manual

- Endangered Species Act of 1973
- Migratory Bird Hunting and Conservation Stamp Act
- Migratory Bird Treaty Act of 1918
- National Environmental Policy Act of 1969

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.

Goals of the National Wildlife Refuge System

- Preserve, restore, and enhance in their natural ecosystems (when practicable) all species of animals and plants that are endangered or threatened with becoming endangered.
- Perpetuate the migratory bird resource.
- Preserve a natural diversity and abundance of fauna and flora on refuge lands.
- Provide an understanding and appreciation of fish and wildlife ecology and man's role in his environment and to provide refuge visitors with high quality, safe, wholesome, and enjoyable recreational experiences oriented toward wildlife to the extent these activities are compatible with the purposes for which the refuge was established.

REFUGE GOALS

A goal is a descriptive statement of desired future conditions that conveys a purpose.

Riparian Habitat Goal

Restore, enhance, and maintain a mixed deciduous and coniferous riparian habitat to support indigenous wildlife species and perpetuate the ecological integrity of the Fisher River watershed.

Wetland Habitat Goal

Provide breeding, resting, and feeding habitat for wetland-dependent species of northwestern Montana by restoring, maintaining, and enhancing a mosaic of lake, semipermanent, seasonal, temporary, and saturated wetlands.

Grassland Habitat Goal

Restore, enhance, and maintain Intermountain grasslands, with an emphasis on native bunchgrass prairie to provide habitat for migratory birds, species of concern, and associated wildlife species.

Forested Habitat Goal

Enhance and maintain Douglas-fir, ponderosa pine, aspen, and cottonwood forested habitats within the context of the Fisher River watershed for migratory birds, species of concern, and other associated wildlife species.

Invasive Plant Goal

Native plant communities, composition, occurrence, and density exist without degradation by invasive plants, and support associated wildlife.

Migratory Birds Goal

Preserve, restore, and enhance the ecological diversity and abundance of migratory birds of the Intermountain West forest, wetland complexes, riparian habitat, and bunchgrass prairie.

Other Wildlife Goal

Restore and maintain resident and endemic wildlife populations of northwestern Montana to maintain and enhance species diversity of Lost Trail National Wildlife Refuge and Pleasant Valley.

Species of Concern Goal

Contribute to the conservation, enhancement, and recovery of endangered, threatened, and species-of-concern populations in Lost Trail National Wildlife Refuge and Fisher River watershed.

Cultural Resources Goal

Protect, manage, and interpret archaeological, cultural, and historical resources present at Lost Trail National Wildlife Refuge for the benefit of present and future generations.

Public Use Goal

Provide quality wildlife-dependent recreational and educational opportunities for persons of all abilities to learn, understand, and enjoy the Intermountain ecosystem of northwestern Montana; its associated fish, wildlife, and plants of Lost Trail National Wildlife Refuge; and the National Wildlife Refuge System in a safe and compatible manner.

Administration Goal

Provide staffing, funding, and facilities to maintain the long-term integrity of habitats and wildlife resources of Lost Trail National Wildlife Refuge in supporting the achievement of ecosystem and National Wildlife Refuge System goals.

Partnership Goal

Promote and develop partnerships with adjacent landowners, public and private organizations, and other interested individuals to preserve, restore, and enhance a diverse and productive ecosystem of which Lost Trail National Wildlife Refuge is an integral part.

AVAILABILITY OF RESOURCES

Current resources and those unmet funding needs defined as RONS projects for alternative A (appendix I) will be available to administer the CCP, in association with assistance from the MFWP to conduct the hunt program, and partnerships for various refuge projects as defined in alternative A.

ANTICIPATED IMPACTS

Since this refuge is new, there is not much biological or public use information available. It is unknown how fast and to what extent the public use opportunities will be used. Wildlife-dependent public use is generally encouraged on national wildlife refuges as long as it is compatible with the purposes for which the refuge was established. Implementation of a CCP has biological and public use monitoring integrated throughout to determine if management activities or public use need to be modified to keep uses within the compatibility threshold.

Following is a short description of the estimated level of wildlife-dependent recreational activities. For a further evaluation of impacts, please see chapter 5 of the EA, titled "Environmental Consequences."

Wildlife Observation and Photography

Wildlife observation and photography are minimal at this time, but anticipated to increase. These activities might result in some disturbance to wildlife especially if visitors venture too close to sensitive areas (e.g., migratory bird nests, elk calving, and moose foraging). Disturbance is expected to be minimal and have an insignificant effect when properly managed (e.g., access limited to trails at times, nest buffer zones, and closures).

Hunting

Please see the compatibility determination completed for the hunt program on the refuge in December 2001. Hunting was considered compatible and had the regional director's signature for concurrence.

Fishing

A single youth fishing event per year is the only fishing that might be allowed under alternative A (proposed action). This level of fishing is so minimal there should be very limited, short-lived disturbance to certain species of wildlife and is not expected to negatively impact the refuge. If it is determined that fish population levels cannot provide a quality event, staff will work with partners such as MFWP to sponsor an event off refuge such as at a nearby WPA. Allowing the public youth to fish will provide environmental education, foster positive public opinion, and help build support for the Service and its natural resource conservation agenda.

Environmental Education and Interpretation

A day use area and an accessible campground for environmental education groups will create localized disturbance and removal of vegetation. However, the benefit of educating visitors to the importance of natural resource conservation and learning about wildlife biology outweigh the minimal impact of site development.

PUBLIC REVIEW AND COMMENT

The draft compatibility determination was provided for intergovernmental review May 2004 and for public review July 2005.

DETERMINATION (CHECK ONE BELOW)

Uses ARE NOT Compatible

Uses ARE Compatible with the following stipulations

Stipulations Necessary to Ensure Compatibility

Visitors will need to comply with refuge brochures and tear sheets for refuge closures, time of year access limited to trails, and be in accordance with state of Montana regulations and licensing requirements.

Justification for Compatibility Determination

The U.S. Fish and Wildlife Service's current policy is to expand and enhance opportunities for high-quality wildlife-dependent public use, with emphasis on hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation.

These uses are generally considered to be appropriate with the purposes of the refuge and meet the refuge public use goal to provide for compatible wildlife-dependent recreation. Monitoring of biological and public use impacts is stipulated to maintain within the comparability threshold.

Signatures

Ray Washtak, Refuge Manager
Lost Trail National Wildlife Refuge

Date

Steve Kallin, Project Leader
National Bison Range complex

Date

Concurrence

Steve Berendzen, Refuge Supervisor (MT, UT, WY)
U.S. Fish and Wildlife Service, Region 6

Date

Richard A. Coleman, Ph.D., Asst. Regional Director
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U.S. Fish and Wildlife Service, Region 6

Date

Mandatory 10- or 15-year Reevaluation Date: 2020

Appendix C—List of Preparers

This document is the result of the extensive, collaborative, and enthusiastic efforts by the members of the planning team:

<i>Team Member</i>		<i>Current Work Unit</i>
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Besides Mr. Grant and Mr. Williams, the Service acknowledges and expresses gratitude to the MFWP for the relevance of the role played by their members in the CCP planning process.

Additionally, the following staffs of region 6 of the Service were of enormous help through their review and input on the drafts of this document:

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- Rick Coleman, assistant regional director
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- Sheri Fetherman, chief of education and visitor services
- Jaymee Fojtik, *former* GIS specialist
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- Toni Griffin, refuge planner
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PUBLIC INVOLVEMENT

Public scoping was initiated for Lost Trail National Wildlife Refuge in January 1998. At this time, issue workbooks were mailed and open houses were held for public input on management to be dealt with in the CCPs for all the refuges of the National Bison Range complex. Lost Trail National Wildlife Refuge was in the preliminary stages of being considered for acquisition, yet the Service requested comments on its management as well. Many of the public comments from the open houses and issue workbooks were general comments for all units of the complex being managed as part of the Refuge System. They are included here for Lost Trail National Wildlife Refuge as well.

Another scoping meeting was held only for Lost Trail National Wildlife Refuge in May 1998 to request input from the public regarding the acquisition and management of the refuge. Twenty-two people attended the Kalispell, Montana, meeting, and approximately 48 written comments were received during the entire comment period. Comments received identified biological, social, and economic concerns regarding management.

During the acquisition process and in the acquisition EA, the Service stated that hunting would be evaluated and potentially allowed within 1 year after purchase. The Service missed that deadline, and the development of the EA for hunting and hunt step-down plan were accelerated to open the refuge to hunting for the fall 2002 season, concurrently with the development of the CCP.

A public open house was held at the refuge to request public comment on hunting on March 1, 2001. Forty-five people came to the open house and public comments were received in the mail. Most of the input was requesting the refuge to be open to big game and waterfowl hunting.

An analysis of six alternatives for hunting were evaluated in the EA. The EA and draft hunt plan were released to the public October 30, 2001, for a 30-day comment period. An open house specifically for the public to ask questions and provide input regarding the EA and draft plan was held November 15, 2001. The public provided comments during the open house and by mailing them to the refuge. A large number of comments this time were to keep the Refuge closed to hunting. The approved preferred alternative in the hunt EA served as the guideline for the development of the step-down hunt plan. It outlines the specific details of how the hunt program is carried out.

Development of the CCP continued with an EA with four alternatives. The EA was reviewed during an internal review of the draft CCP and EA in April and May 2004. This draft CCP and EA is being released to the public in July 2005 and there will be open house meetings in Libby (July 27) and Kalispell (July 28) to provide an overview of the resources in the refuge and of the draft CCP and EA. Service staff will entertain questions and receive comments from the attending public. These open house meetings have been advertised in the local media in Montana. During the entire development of the draft CCP and its EA, the refuge staff has discussed the planning process with local county commissioners, sportsmen and women's groups, and other interested groups. In addition, the refuge staff has invited the local tribal and state agencies to participate in the development of this draft CCP and EA.

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Columbia Falls Library
Columbia Falls, MT

Whitefish City Library
Whitefish, MT

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Chris Peterson
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Daily Interlake
Dave Reese
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166 individuals

Appendix E—List of Animal and Plant Species

This appendix presents a list of animal species present in the Pleasant Valley ecosystem. In addition, plant species mentioned in the CCP are listed.

Species with confirmed sightings on Lost Trail National Wildlife Refuge are followed by an asterisk (*).

ANIMALS

BIRDS

Loons

Common loon (*Gavia immer*)

Grebes

Pied-billed grebe (*Podilymbus podiceps*)*
Horned grebe (*Podiceps autitus*)*
Eared grebe (*P. nigricollis*)*
Red-necked grebe (*P. grisegena*)*
Western grebe (*Aechmophorus occidentalis*)
Clark's grebe (*A. clarkii*)

Cormorants

Double-crested cormorant (*Phalacrocorax auritus*)

Herons and Bitterns

Great blue heron (*Ardea herodias*)*
Black-crowned night-heron (*Nycticorax nycticorax*)
American bittern (*Botaurus lentiginosus*)*

Swans, Geese, and Ducks

Tundra swan (*Cygnus columbianus*)
Trumpeter swan (*C. buccinator*)
Ross' goose (*Chen rossii*)
Canada goose (*Branta canadensis*)*
Snow goose (*Chen caerulescens*)
Gadwall (*Anas strepera*)*
Mallard (*A. platyrhynchos*)
Northern pintail (*A. acuta*)
American wigeon (*A. americana*)*
Eurasian wigeon (*A. penelope*)
Wood duck (*Aix sponsa*)*
Northern shoveler (*Anas clypeata*)*
Blue-winged teal (*A. discors*)*
Green-winged teal (*A. crecca*)*
Cinnamon teal (*A. cyanoptera*)*
Canvasback (*Aythya valisineria*)*
Redhead (*A. americana*)*
Ring-necked duck (*A. collaris*)*
Greater scaup (*A. marila*)
Lesser scaup (*A. affinis*)*
Common goldeneye (*Bucephala clangula*)*
Barrow's goldeneye (*B. islandica*)*
Bufflehead (*B. albeola*)*
Ruddy duck (*Oxyura jamaicensis*)*

Common merganser (*Mergus merganser*)*
Red-breasted merganser (*M. serrator*)
Hooded merganser (*Lophodytes cucullatus*)*

New World Vultures

Turkey vulture (*Cathartes aura*)

Osprey, Hawks, and Eagles

Osprey (*Pandion haliaetus*)*
Northern harrier (*Circus cyaneus*)*
Golden eagle (*Aquila chrysaetos*)*
Bald eagle (*Haliaeetus leucocephalus*)*
Sharp-shinned hawk (*Accipiter striatus*)
Cooper's hawk (*A. cooperii*)
Northern goshawk (*A. gentiles*)
Red-tailed hawk (*Buteo jamaicensis*)
Swainson's hawk (*B. swainsoni*)
Rough-legged hawk (*B. lagopus*)
Ferruginous hawk (*B. regalis*)

Falcons

American kestrel (*Falco sparverius*)*
Merlin (*F. columbarius*)
Prairie falcon (*F. mexicanus*)*
Peregrine falcon (*F. peregrinus*)*
Gyr Falcon (*F. rusticolus*)

Gallinaceous Birds

Gray partridge (*Perdix perdix*)
Wild turkey (*Meleagris gallopavo*)*
Ruffed grouse (*Bonasa umbellus*)*
Spruce grouse (*Falcapennis Canadensis*)*
Blue grouse (*Dendragapus obscurus*)*
White-tailed ptarmigan (*Lagopus leucurus*)

Rails and Coots

Virginia rail (*Rallus limicola*)
Sora (*Porzana carolina*)*
American coot (*Fulica americana*)*

Cranes

Sandhill crane (*Grus canadensis*)*

Plovers

Killdeer (*Charadrius vociferus*)*

Avocets and Stilts

American avocet (*Recurvirostra americana*)*
Black-necked stilt (*Himantopus mexicanus*)

Sandpipers and Phalaropes

Greater yellowlegs (*Tringa melanoleuca*)*
Lesser yellowlegs (*T. flavipes*)
Solitary sandpiper (*T. solitaria*)
Spotted sandpiper (*Actitis macularia*)*
Long-billed curlew (*Numenius americanus*)
Sanderling (*Calidris alba*)
Semipalmated sandpiper (*C. pusilla*)
Western sandpiper (*C. mauri*)
Least sandpiper (*C. minutilla*)
Baird's sandpiper (*C. bairdii*)
Pectoral sandpiper (*C. melanotos*)
Long-billed dowitcher (*Limnodromus scolopaceus*)*
Common snipe (*Gallinago gallinago*)*
Wilson's phalarope (*Phalaropus tricolor*)*
Red-necked phalarope (*P. lobatus*)

Gulls and Terns

Franklin's gull (*L. pipixcan*)
Bonaparte's gull (*L. philadelphia*)
Ring-billed gull (*L. delawarensis*)
California gull (*L. californicus*)
Herring gull (*L. argentatus*)
Forster's tern (*Sterna forsteri*)
Common tern (*S. hirundo*)
Black tern (*Chlidonias niger*)*

Pigeons and Doves

Band-tailed pigeon (*Columba fasciata*)
Mourning dove (*Zenaidura macroura*)*

Cuckoos

Yellow-billed cuckoo (*Coccyzus americanus*)

Typical Owls

Barn owl (*Tyto alba*)
Great horned owl (*Bubo virginianus*)*
Barred owl (*Strix varia*)
Great gray owl (*S. nebulosa*)*
Snowy owl (*Nyctea scandiaca*)
Western screech-owl (*Otus kennicotti*)
Flammulated owl (*O. flammeolus*)
Northern pygmy-owl (*Glaucidium gnoma*)
Northern saw-whet owl (*Aegolius acadicus*)
Boreal owl (*A. funereus*)
Burrowing owl (*Athene cunicularia*)

Nightjars

Common nighthawk (*Chordeiles minor*)*

Swifts

Black swift (*Cypseloides niger*)
Vaux's swift (*Chaetura vauxi*)
White-throated swift (*Aeronautes saxatalis*)

Hummingbirds

Black-chinned hummingbird (*Archilochus alexandri*)

Broad-tailed hummingbird (*Selasphorus platycercus*)
Calliope hummingbird (*Stellula calliope*)*
Rufous hummingbird (*Selasphorus rufus*)

Kingfishers

Belted kingfisher (*Ceryle alcyon*)*

Woodpeckers

Lewis's woodpecker (*Melanerpes lewis*)*
Northern flicker (*Colaptes auratus*)*
Williamson's sapsucker (*Sphyrapicus thyroideus*)
Red-naped sapsucker (*S. nuchalis*)*
Downy woodpecker (*Picoides pubescens*)*
Hairy woodpecker (*P. villosus*)*
Three-toed woodpecker (*Picoides tridactylus*)*
Black-backed woodpecker (*P. arcticus*)*
Pileated woodpecker (*Dryocopus pileatus*)*

Tyrant Flycatchers

Olive-sided flycatcher (*Contopus cooperi*)*
Western wood-pewee (*Contopus virens*)*
Willow flycatcher (*Empidonax traillii*)*
Least flycatcher (*E. minimus*)*
Hammond's flycatcher (*Amphidonas hammondi*)*
Dusky flycatcher (*E. oberholseri*)*
Cordilleran flycatcher (*E. occidentalis*)
Say's phoebe (*Sayornis saya*)
Eastern kingbird (*Tyrannus tyrannus*)*
Western kingbird (*T. verticalis*)

Shrikes

Loggerhead shrike (*Lanius ludovicianus*)
Northern shrike (*L. excubitor*)

Vireos

Blue-headed vireo (*Vireo solitarius*)*
Red-eyed vireo (*V. olivaceus*)
Warbling vireo (*V. gilvus*)*

Jays, Magpies, and Crows

Blue jay (*Cyanocitta cristata*)
Stellar's jay (*C. stelleri*)
Gray jay (*Perisoreus canadensis*)
Clark's nutcracker (*Nucifraga columbiana*)*
Black-billed magpie (*Pica hudsonia*)*
American crow (*Corvus brachyrhynchos*)*
Common raven (*C. corax*)*

Larks

Horned lark (*Eremophila alpestris*)

Swallows

Tree swallow (*Tachycineta bicolor*)*
Violet-green swallow (*T. thalassina*)*
Bank swallow (*Riparia riparia*)*
Cliff swallow (*Hirundo pyrrhonota*)*
Northern rough-winged swallow (*Stelgidopteryx serripennis*)*
Barn swallow (*H. rustica*)*

Chickadees

- Black-capped chickadee (*Parus atricapillus*)*
- Mountain chickadee (*P. sclateri*)*
- Chestnut-backed chickadee (*P. rufescens*)
- Boreal chickadee (*P. hudsonicus*)

Nuthatches

- White-breasted nuthatch (*Sitta carolinensis*)*
- Red-breasted nuthatch (*S. canadensis*)*
- Pygmy nuthatch (*S. pygmaea*)

Creepers

- Brown creeper (*Certhia americana*)

Wrens

- House wren (*Troglodytes aedon*)*
- Winter wren (*T. troglodytes*)
- Rock wren (*Salpinctes obsoletus*)
- Canyon wren (*Catherpes mexicanus*)
- Marsh wren (*Cistothorus palustris*)*

Dippers

- American dipper (*Cinclus mexicanus*)

Kinglets

- Golden-crowned kinglet (*Regulus satrapa*)*
- Ruby-crowned kinglet (*R. calendula*)*

Thrushes

- Western bluebird (*Sialia mexicana*)
- Mountain bluebird (*S. currucoides*)*
- Townsend's solitaire (*Myadestes townsendi*)*
- Veery (*Catharus fuscescens*)
- Swainson's thrush (*C. ustulatus*)*
- Hermit thrush (*C. guttatus*)
- Varied thrush (*Ixoreus naevius*)
- American robin (*Turdus migratorius*)*

Mimic Thrushes

- Gray catbird (*Dumetella carolinensis*)*
- Sage thrasher (*Areoscoptes montanus*)

Starlings

- European starling (*Sturnus vulgaris*)*

Pipits

- American (water) pipit (*Anthus rubescens*)

Waxwings

- Bohemian waxwing (*Bombycilla garrulus*)
- Cedar waxwing (*B. cedrorum*)

Wood-warblers

- Tennessee warbler (*Vermivora peregrine*)*
- Orange-crowned warbler (*Ermivora celata*)*
- Nashville warbler (*V. ruficapilla*)
- Yellow-rumped warbler (*Dendrocia coronata*)*
- Townsend's warbler (*D. townsendi*)*
- Yellow warbler (*D. petechia*)*
- MacGillivray's warbler (*Oporornis tolmiei*)*
- Wilson's warbler (*Wilsonia pusilla*)*
- Northern waterthrush (*Seiurus noveboracensis*)
- Common yellowthroat (*Geothlypis trichas*)*

- Yellow-breasted chat (*Icteria virens*)
- American redstart (*Setophaga ruticilla*)

Tanagers

- Western tanager (*Piranga ludocviciana*)*

Sparrows and Towhees

- Spotted towhee (*Pipilo maculatus*)*
- American tree sparrow (*Spizella arborea*)
- Chipping sparrow (*S. passerina*)*
- Clay-colored sparrow (*S. pallida*)
- Brewer's sparrow (*S. pallida*)
- Lark sparrow (*Chondestes grammacus*)
- Grasshopper sparrow (*Ammodramus savannarum*)*
- Le Conte's sparrow (*A. lecontei*)
- Fox sparrow (*Passerella iliaca*)
- Savannah sparrow (*Passerculus sandwichensis*)*
- Lincoln's sparrow (*Melospiza lincolni*)
- Song sparrow (*M. melodia*)*
- Vesper sparrow (*Pooecetes gramineus*)*
- Harris' sparrow (*Zonotrichia querula*)
- White-throated sparrow (*Z. albicollis*)
- White-crowned sparrow (*Z. leucophrys*)
- Dark-eyed junco (*Junco hyemalis*)*
- Lapland longspur (*Calcarius lapponicus*)

Grosbeaks and Allies

- Snow bunting (*Plectrophenax nivalis*)*
- Rose-breasted grosbeak (*Phaeucticus ludovicianus*)
- Black-headed grosbeak (*P. melanocephalus*)*
- Lazuli bunting (*Passerina amoena*)*

Blackbirds and Orioles

- Western meadowlark (*Sturnella neglecta*)*
- Yellow-headed blackbird (*Xanthocephalus xanthocephalus*)*
- Red-winged blackbird (*Agelaius phoeniceus*)*
- Common grackle (*Quiscalus quiscula*)
- Brewer's blackbird (*Euphagus cyanocephalus*)*
- Brown-headed cowbird (*Molothrus ater*)*
- Northern oriole (*Icterus galbula*)*

Finches

- Cassin's finch (*Carpodacus cassinii*)
- Red crossbill (*Loxia curvirostra*)*
- White-winged crossbill (*L. leucoptera*)
- Pine grosbeak (*Pinicola enucleator*)
- Pine siskin (*Carduelis pinus*)*
- American goldfinch (*C. tristis*)*
- Common redpoll (*C. flammea*)
- Hoary redpoll (*C. hornemanni*)
- Evening grosbeak (*Coccothraustes vespertinus*)*

Old World Sparrows

- House sparrow (*Passer domesticus*)*

MAMMALS

- Badger (*Taxidea taxus*)*
- Beaver (*Castor canadensis*)*
- Big brown bat (*Eptesicus fuscus*)

Black bear (*Ursus americanus*)*
 Bobcat (*Lynx rufus*)
 Bushy-tailed woodrat (*Neotoma cinerea*)
 California myotis (*Myotis californicus*)
 Canada lynx (*Lynx canadensis*)*
 Columbian ground squirrel (*Spermophilus columbianus*)*
 Coyote (*Canis latrans*)*
 Deer mouse (*P. maniculatus*)*
 Elk (*Cervus elaphus*)*
 Fisher (*Martes pennanti*)
 Golden-mantled ground squirrel (*Spermophilus lateralis*)
 Gray wolf (*Canis lupus*)*
 Grizzly bear (*Ursus arctos*)
 Hoary bat (*Lasiurus cinereus*)
 Hoary marmot (*Marmota caligata*)
 House mouse (*Mus musculus*)
 Little brown myotis (*Myotis lucifungus*)*
 Ling-eared myotis (*M. keenii*)
 Long-legged myotis (*M. volans*)
 Long-tailed vole (*Microtus longicaudus*)
 Long-tailed weasel (*Mustela frenata*)
 Marten (*Martes americana*)
 Masked shrew (*Sorex cinereus*)
 Meadow vole (*Microtus pennsylvanicus*)*
 Merriam's shrew (*Sorex merriami*)
 Mink (*Mustela vison*)
 Moose (*Alces alces*)*
 Mountain cottontail (*Sylvilagus nuttallii*)
 Mountain lion (*Puma concolor*)*
 Mule deer (*Odocoileus hermionus*)*
 Muskrat (*Ondatra zibethicus*)*
 Northern bog lemming (*Synaptomys borealis*)
 Northern flying squirrel (*Glaucomys sabrinus*)
 Northern pocket gopher (*Spermophilus richardsonii*)
 Northern river otter (*Lontra canadensis*)*
 Norway rat (*Rattus norvegicus*)
 Pika (*Ochotona princeps*)
 Porcupine (*Erethizon dorsatum*)
 Preble's shrew (*Sorex preblei*)
 Pygmy shrew (*Blarina brevicauda*)
 Raccoon (*Procyon lotor*)
 Red fox (*Vulpes vulpes*)
 Red squirrel (*Tamiasciurus hudsonicus*)
 Red-tailed chipmunk (*Tamias ruficaudus*)
 Short-tailed weasel (*Mustela erminea*)
 Silver-haired bat (*Lasiorycteris noctivagans*)
 Snowshoe hare (*Lepus americanus*)*
 Southern red-backed vole (*Clethrionomys gapperi*)
 Striped skunk (*Mephitis mephitis*)
 Townsend's big-eared bat (*Plecotus townsendii*)
 Vagrant shrew (*Sorex vagrans*)
 Water shrew (*S. palustris*)
 Water vole (*Microtus richardsonii*)
 Western heather vole (*Phenacomys intermedius*)
 Western jumping mouse (*Zapus princeps*)
 White-tailed deer (*Odocoileus virginianus*)*
 White-tailed jackrabbit (*Lepus townsendii*)
 Wolverine (*Gulo gulo*)*
 Yellow-bellied marmot (*Marmota flaviventris*)

Yellow-pine chipmunk (*Tamias amoenus*)
 Yuma myotis (*Myotis yumanensis*)

AMPHIBIANS AND REPTILES

Amphibians

Boreal toad (*Bufo boreas*)*
 Bullfrog (*Rana catesbeiana*)
 Coeur D'Alene salamander (*Plethodon idahoensis*)
 Idaho giant salamander (*Dicamptodon aterrimus*)
 Long-toed salamander (*Ambystoma macrodactylum*)*
 Northern leopard frog (*Rana pipiens*)
 Pacific chorus frog (*Pseudacris regilla*)*
 Roughskin newt (*Taricha granulose*)
 Spotted frog (*Rana pretiosa*)*
 Tailed frog (*Ascaphus truei*)
 Tiger salamander (*Ambystoma tigrinum*)
 Wood frog (*Rana sylvatica*)

Reptiles

Common garter snake (*Thamnophis sirtalis*)*
 Northern alligator izard (*Elgaria coerulea*)
 Painted turtle (*Chrysemys picta*)*
 Racer (*Coluber constrictor*)
 Rubber boa (*Charina bottae*)
 Western rattlesnake (*Crotalus viridis*)
 Western skink (*Eumeces skiltonianus*)
 Western terrestrial garter snake (*Thamnophis elegans*)*

FISH

Northern pike minnow (*Ptychocheilus oregonensis*)
 Pumpkinseed (*Lepomis gibbosus*)
 Redside shiner (*Richardsonius balteatus*)
 Yellow perch (*Perca flavescens*)

PLANTS

GRASSES AND SEDGES

Alkali cordgrass (*Spartina gracilis*)
 Alkaligrass (*Puccinellia nuttalliana*)
 Basin wildrye (*Elymus cinereus*)
 Blue wildrye (*Elymus glaucus*)
 Bluebunch wheatgrass (*Pseudoregneria spicata*)
 Bulrush (*Scirpus acutus*)
 Cheatgrass (*Bromus tectorum*)
 Columbia needlegrass (*Stipa columbiana*)
 Crested wheatgrass (*Agropyron desertorum*)
 Elk sedge (*Carex geyeri*)
 Foxtail barley (*Hordeum jubatum*)
 Idaho fescue (*Festuca idahoensis*)
 Intermediate wheatgrass (*Agropyron intermedium*)
 Kentucky bluegrass (*Poa pratensis*)
 Lily pad (*Nuphar* spp.)
 Mountain brome (*Bromus carinatus*)

Needle and thread (*Stipa comata*)
 Orchard grass (*Dactylis glomerata*)
 Pine grass (*Calamagrostis rubescens*)
 Prairie junegrass (*Koeleria cristata*)
 Quack grass (*Agropyron repens*)
 Red threeawn (*Aristida longiseta*)
 Red top (*Agrostis stolonifera*)
 Reed canarygrass (*Phalaris arundinacea*)
 Richardson needlegrass (*Stipa richardsonii*)
 Rough fescue (*Festuca scabrella*)
 Sandberg bluegrass (*Poa secunda*)
 Sedge (*Carex* spp.)
 Slender wheatgrass (*Agropyron trachycaulum*)
 Smooth brome (*Bromus inermis*)
 Timothy (*Phleum pratense*)
 Tufted hairgrass (*Deschampsia caespitosa*)
 Western fescue (*Festuca occidentalis*)
 Western wheatgrass (*Agropyron smithii*)
 Wild oat (*Avena fatua*)

FORBS

Alberta penstemon (*Penstemon albertinus*)
 Alumroot (*Heuchera richardsonii*)
 Black medic (*Medicago lupulina*)
 Buckwheat (*Eriogonum* spp.)
 Canada thistle (*Cirsium arvense*)
 Common toadflax (*Linaria vulgaris*)
 Cudweed sagewort (*Artemisia ludoviciana*)
 Dogwood (*Cornus sericea*)
 Elk thistle (*Cirsium scariosum*)
 Fringed sage (*Artemisia frigida*)
 Glacier lily (*Erythronium grandiflorum*)
 Orange hawkweed (*Hieracium aurantiacum*)
 Meadow hawkweed (*H. pratense*)
 Heartleaf arnica (*Arnica cordifolia*)
 Horsetail (*Equisetum arvense*)
 Littleleaf penstemon (*Penstemon procerus*)
 Owl clover (*Orthocarpus tenuifolius*)
 Prairie smoke (*Geum triflorum*)
 Purple aster (*Symphotrichum patens*)
 Purple mariposa (*Calochortus nitidus*)
 Pussy toes (*Antemana neglecta*)
 Round alumroot (*Heuchera cylindrical*)
 Sage buttercup (*Ranunculus glaberrimus*)
 Shrubby cinquefoil (*Pentaphragmoides florib*)
 (*Potentilla fruticosa*)
 Silky lupine (*Hupinus sericeus*)

Silver sage (*Artemisia cana*)
 Solomon's seal (*Polygonatum odoratum*)
 Spotted knapweed (*Centaurea maculosa*)
 St. Johns-wort (*Hypericum perforatum*)
 Sticky geranium (*Geranium viscosissimum*)
 Stinging nettle (*Urtica dioica*)
 Stoneseed (*Lithospermum tuberosum*)
 Sulphur cinquefoil (*Potentilla recta*)
 Tansy ragwort (*Senecio jacobaea*)
 Twinflower (*Linnaea borealis*)
 Umbrella plant (*Cyperus alternifolia*)
 Veiny meadowrue (*Thalictrum venulosum*)
 Velvet lupine (*Lupinus leucophyllus*)
 Western gromwell (*Lithospermum ruderales*)
 White vetch (*Vicia grandiflora*)
 Wild strawberry (*Fragaria virginiana*)
 Yarrow (*Achillea millefolium*)
 Yellow cinquefoil (*Potentilla megalantha*)
 Yellow penstemon (*Penstemon confertus*)

SHRUBS

Chokecherry (*Prunus virginiana*)
 Currant (*Ribes aureum*)
 Dwarf huckleberry (*Vaccinium cespitosum*)
 Kinnikinnick (*Arctostaphylos uva-ursi*)
 Oregon grape (*Berberis repens*)
 Rose (*Rosa* spp.)
 Russet buffalo berry (*Shepherdia argentea*)
 Serviceberry (*Amelanchier arborea*)
 Snowberry (*Symphoricarpos albus*)
 White spirea (*Spiraea albiflora*)

TREES

Aspen (*Populus tremuloides*)
 Cottonwood (*Populus balsamifera*)
 Douglas-fir (*Pseudotsuga menziesii*)
 Englemann spruce (*Picea englemanni*)
 Grand fir (*Abies grandis*)
 Juniper spp. (*Juniperus* spp.)
 Lodgepole pine (*Pinus contorta*)
 Ponderosa pine (*Pinus ponderosa*)
 Speckled alder (*Alnus incana*)
 Subalpine fir (*Abies lasiocarpa*)
 Water birch (*Betula papyrifera*)
 Western larch (*Larix occidentalis*)
 Willow (*Salix* spp.)

Appendix F—Authorized Public Uses



U.S. Fish & Wildlife Service

Lost Trail

National Wildlife Refuge

Authorized Public Uses

2005 - 2006

Welcome

Lost Trail National Wildlife Refuge (NWR) is the 519th refuge inducted into the National Wildlife Refuge System. We invite the public to the Refuge for wildlife observation, wildlife photography, environmental education, and access to adjacent State and Plum Creek Timber Company (PCTC) lands. At this time, limited public use is permitted on the Refuge. A Comprehensive Conservation Plan (CCP), which involves public review, is currently being completed for the Refuge and will determine public use that will be permitted in the future.

General Information

This 7,885-acre Refuge, established in 1999, is managed for the benefit of migratory birds and other wildlife species. The Refuge shares portions of its boundary with PCTC, the Montana Department of Natural Resources and Conservation (DNRC), and private landowners. Visitors and hunters must have landowner permission before accessing or hunting on private property. Lost Trail NWR is a satellite unit of the National Bison Range Complex headquartered in Moiese, Montana.

Directions

The Refuge can be reached via Highway 2 by going west from Kalispell approximately 20 miles to Marion. Turn right (north) at Marion onto Pleasant Valley Road. After approximately 1.3 miles, the blacktop road will fork. Stay to the right! Continue on the main gravel road (Pleasant Valley Road) about 13 miles; the Refuge headquarters is located north of the County Road.

Parking on the Refuge

- Parking areas are located on North 1019 Road near Bleise Road and on the west end of the Refuge at the intersection of South Pleasant Valley Road and the County Road.
- Parking along North 1019 Road and Orr Road is prohibited.
- Blocking roads or gates is prohibited.

State Land

Four parcels of State land within the “executive boundary” of the Refuge are owned and managed by the DNRC. These parcels are not part of the Refuge and are open to public recreation according to State law. A Recreational Use License is required and can be obtained from any authorized Montana Fish, Wildlife and Parks license agent.

Authorized Public Uses

- Visitors are allowed to observe or photograph wildlife, hike, cross-country ski, or snowshoe throughout the Refuge, except in the seasonally closed area, (closed September 1 through December 10).
- Motorized access to PCTC land is permitted via Pleasant Valley Road (County Road), North 1019 Road, and Orr Road (see map). PCTC’s “Open Lands Policy” provides recreational rules and guidelines; copies are available at any PCTC office and at the Refuge headquarters.
- Refuge management allows mountain bike (non-motorized) and horseback use on those roads designated on the map for non-motorized access.
- Regulations and further information are available at the Refuge headquarters.

To Protect You And The Refuge

- Possession or discharge of firearms or archery equipment in designated closed areas is prohibited.
- Pets must be on a leash and attended at all times.
- Motorized use of the Refuge is allowed only on North 1019 Road, Orr Road, or the Pleasant Valley Road (County Road).
- Off-road vehicle travel is strictly prohibited.
- Collecting, injuring, disturbing, destroying, or harming animals, animal parts (including horns), or plants is not permitted unless authorized.
- Open fires are prohibited.
- Overnight camping is prohibited.
- Please comply with all signs.
- Shooting into a closed area is prohibited.

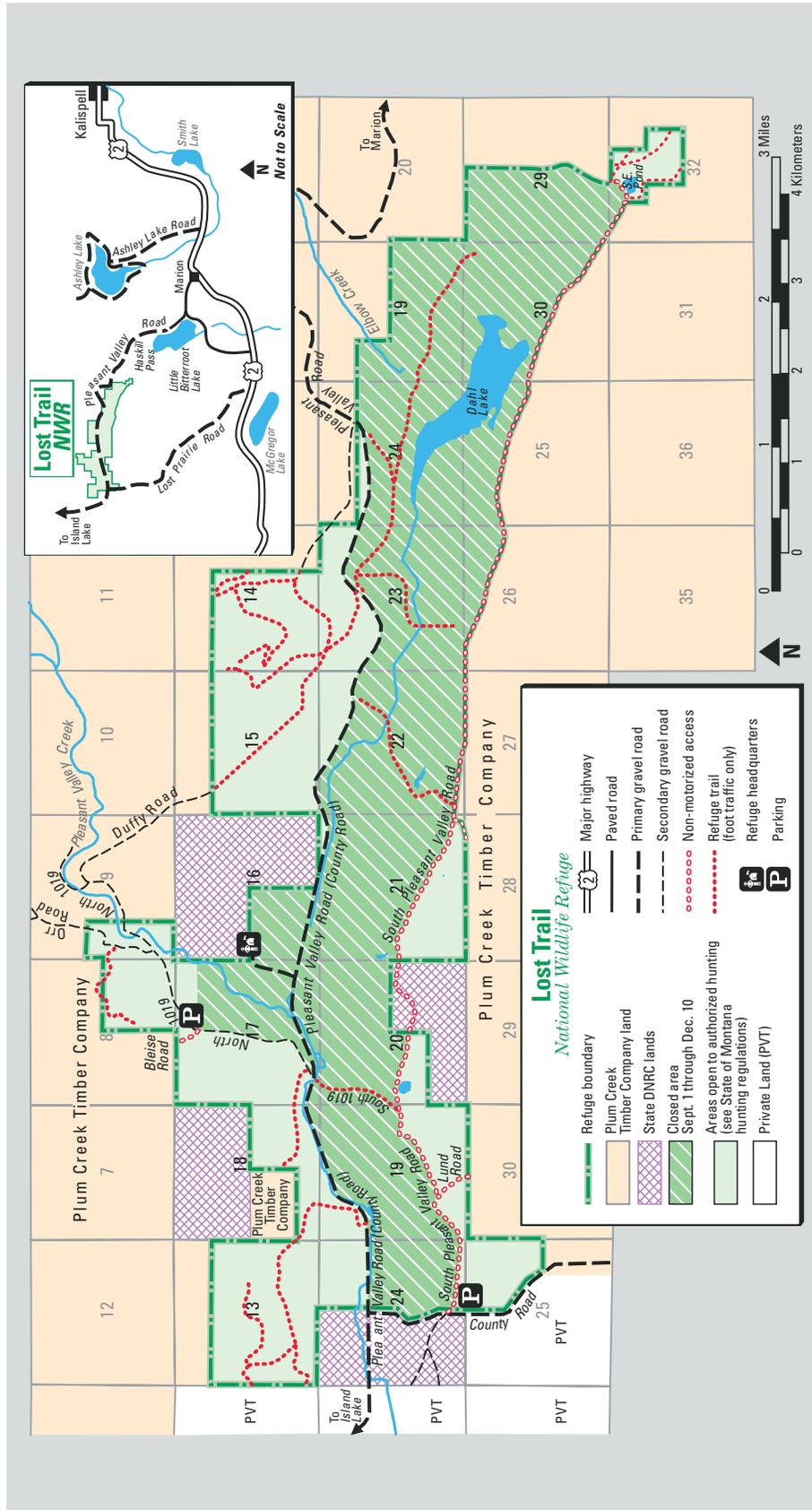
Refuge Hunting Regulations

Hunting elk, white-tailed deer, mule deer, turkey, and mountain grouse is permitted on the Refuge, except in designated closed areas. ***The Closed Area is outlined on the map. This area is closed to all public access from September 1 through December 10.*** All State of Montana hunting regulations apply; in addition the following Refuge regulations apply:

- ***The first week of archery and the first week of general deer and elk season is open to youth (12-14) only. Youth hunters must be accompanied by an adult who is at least 21 years of age.***
- Guiding or outfitting is prohibited.
- Hunters need consent from the Refuge manager before retrieving game from within the closed area.
- Portable or temporary blinds or tree stands are permitted, but must be removed on a daily basis.
- Refuge management allows mountain bike (non-motorized) and horseback riding or pack stock on those roads designated on the map for non-motorized access.
- Dogs may not be used for hunting.
- ***Coyote hunting and ground squirrel shooting are not permitted under Refuge hunting regulations.***
- When hunting grouse or turkey on the Refuge, only a shotgun no larger than a 10-gauge and federally approved non-toxic shot may be used.

Accessibility Information

Equal opportunity to participate in and benefit from programs and activities of the U.S. Fish and Wildlife Service is available to all individuals regardless of physical or mental ability. Dial 7-1-1 for a free connection to the State transfer relay service for TTY and voice calls to and from the speech and hearing impaired. For information or to address accessibility needs, please contact the Refuge staff at 406 / 858 2216 or the U.S. Department of the Interior, Office of Equal Opportunity, 1849 C Street, NW, Washington, D.C. 20240.



Refuge Signs And Their Meaning

Refuge Boundary



Areas are open to permitted activities only.

Regulations and further information are available at the Refuge headquarters.

No Hunting



Areas behind this sign are closed to hunting.

Public Hunting Area



Areas behind this sign are open to public hunting for deer, elk, turkey, and mountain grouse only.

Lost Trail National Wildlife Refuge

6295 Pleasant Valley Road
 Marion, MT 59925
 406 / 858 2216
 406 / 858 2218 fax
 Ray_Washtak@fws.gov

U.S. Fish and Wildlife Service
<http://www.fws.gov>

For Refuge System Information
 1 800 344 WILD

Montana Department of Fish, Wildlife and Parks

490 N. Meridian
 Kalispell, MT 59901
 406 / 752 5501

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Appendix G—List of Facilities

Facilities on the Lost Trail National Wildlife Refuge are listed below.

<i>Buildings</i>	One 4-bedroom, 2-bath residence
	One 3-bedroom, 2-bath residence with a 2-car garage
	One 3-bedroom, 2-bath modular residence
	One small, single unit residence consisting of a single room with bath, kitchen, and bedroom
	One large indoor horse arena with a 4-bedroom apartment
	Two log-construction buildings
	One newly constructed office complex consisting of 3 offices, an administrative area, and a visitor contact area
	Two log-construction horse barns with stalls
	One old, unusable cattle station, which includes an office, numerous holding stalls and pens, small wooden-fenced corrals, and a calving barn previously used for ranch cattle operations
	Three storage buildings
Two shop areas (one currently being used)	
<i>Infrastructure</i>	Three wells that supply potable water to the residences (one well is located at the “lake house” area and is currently not being used)
	Five underground septic systems (all operational, one system not being used)
<i>Fences and Roads</i>	Approximately 70 miles of 4- and 5-strand barbwire boundary and interior fence
	Approximately 28 miles of interior and boundary roads (grass-covered “two-track” roads and graveled roads)
	Several culverts and cattle guards
	Pleasant Valley Road
	One county-maintained road traverses the refuge east-to-west
<i>Artificial Habitats</i>	Ten artificial wetlands

Appendix H—Management Rationale

This appendix describes the rationale for development of the objectives and strategies, specific to the management alternatives (chapter 4).

The rationale describes the background, assumptions, and technical details so that the reader can understand how and why objectives and strategies were formulated.

The rationale is organized following the order of topics in chapter 4.

RIPARIAN HABITAT

Rationale 1 (all alternatives): The riparian and aspen woodlands were heavily grazed in the past. This resulted in scattered, height-suppressed shrubs; a sparse, even-aged overstory of willow, alder, and aspen; and an herbaceous layer in some areas where invasive species have replaced native species. Aspen and woody, riparian shrubs have not been as easily recruited, resulting in structurally simple woodlands.

Grazing can result in degradation of resources, especially when combined with other impacts. If care is not exercised and range grasses are overgrazed, often they will be encroached on by invasive species.

Vigor must be returned to accomplish productivity needed to regain the native, climax community (i.e., native plants in their “correct” percent compositions). Rest from cattle grazing would allow managers to determine current grassland conditions (cover, height, and productivity).

Prescribed fire is one method of promoting quaking aspen, and keeping conifers from succeeding.

“Burning increases soil pH and adds organic carbon and nutrient to the soil. However, fire will probably not rejuvenate the stand if quaking aspen biomass is so low that burning does not appreciably raise soil pH and nutrient levels. Sucker vigor will probably be low.”
(Howard 1996; Tirmenstein 1988)

Aspen regenerate from seed and by sprouting from the roots. Germination and seedling survival require a moist, mineral seedbed with adequate drainage, moderate temperature, and freedom from competition (McDonough 1979).

Rationale 2 (all alternatives): It is unknown how long it would take the water regime to be restored. In addition, it is unknown how long it would be before native fish populations could be restored, or

even if they could be restored to a level that could support quality sport fishing. Historically, the valley may never have had a viable fishery resource.

The cost, personnel, and time needed to restore the fisheries to a level that could support fishing may be large enough to make restoration within the period of this CCP (10–15 years) unrealistic or totally prohibitive. The restored hydrology may not support large enough populations of sport fish species for a quality fishing program. Until a restoration program moves forward and is successful, the objective of providing fishing opportunities cannot be implemented.

Rationale 3 (alternatives A, B, and C): The NRCS purchased a wetland reserve easement from the MPC for the entire section of Pleasant Valley Creek on the refuge. The WRP project has the following goals that relate to the Pleasant Valley Creek habitat:

- Address habitat needs for a diversity of fish and wildlife with a priority for species most impacted by degraded condition, beaver, moose, and those of ESA concern such as bull trout, westslope cutthroat trout, and redband trout.
- Restore wetland hydrology and vegetation to historical conditions.
- Restore streams to historic channels and function, where feasible.
- Restore fisheries habitat and aid fish passage to tributary channels, where feasible.

The NRCS restoration plan includes only the south section of Pleasant Valley Creek, beginning at Lower Moose Pond area and flowing west out of the refuge. The restoration plan calls for stream sinuosity and streambank vegetation.

Lower Moose Pond is an artificial impoundment developed years ago when the refuge was a working cattle ranch. The dam has been breached; however, a functioning pond still exists. This pond provides waterfowl pair habitat and is one of the two locations on the refuge that has been documented as one of the largest reproductive sites for boreal toads in the Rocky Mountains.

The refuge would like to foster NRCS efforts for revegetation further north on the creek; maintain waterfowl, songbirds, and amphibian habitat; and work with the MFWP to monitor stream quality for native fisheries so as to not contribute to degradation of the Fisher River drainage.

Pleasant Valley Creek is a tributary of the Fisher River. Fisher River is an important focus area for native fish restoration for MFWP. Pleasant Valley Creek can contribute to the system as a non-fish-bearing tributary, and possibly as a native-fish-bearing tributary after restoration efforts.

Pleasant Valley Creek presently is a non-fish-bearing tributary of the Fisher River. Historically, it supported Columbia redband trout and westslope cutthroat trout, and drains into the waters of the Fisher River where bull trout are being restored. The Pleasant Valley Creek currently does not support westslope cutthroat, redband trout, or bull trout (Mabbot 1996, Hensler 2001). All three fish species are cold-water species. Water temperature is a critical component of habitat selection for native fish. Pleasant Valley Creek, with its control structures, has the following conditions and effects:

- limited fish movement
- decreased depth and increase water temperature due to ponding and channeling
- large sections of streambanks denuded of native vegetation, which has led to increased water temperatures
- siltation habitat problem

Much of western riparian habitat has been lost or degraded due to flood control, irrigation projects (Hendrickson and Kubly 1984), grazing (Bock 1993), logging, and housing development. This type of habitat is important to a diverse set of migratory birds. The north end of Pleasant Valley Creek is in relatively good condition and has been relatively undisturbed for approximately 10 years. Prior to that, some selective logging occurred. Preliminary bird surveys already suggest bird use by passerines such as song sparrows, and ruby-crowned and golden-crowned kinglets. Stream habitat on the refuge could provide additional habitat for migratory birds with minimal effort—restoration through a revegetation project.

Willow flycatchers breed in riparian habitat with a midstory of 6- to 7-foot alders or willows, interspersed with openings (Casey 2000). This area could be enhanced by planting alders, willow, and hawthorn. This additional stream vegetation would provide migratory bird habitat and foster a reduction in water temperature that would enhance the native fisheries and amphibians. Any future discussion of stream restoration efforts that include changing the ponds on Pleasant Valley Creek would need to evaluate the effects on waterfowl and songbirds.

The boreal toad is a candidate species in Colorado and Wyoming, but not listed in Montana. It was once recorded much more frequently in Montana than the previously mentioned states. However, the extent of boreal toad populations in Montana is unknown due to limited monitoring efforts.

The USGS has been conducting surveys in Montana for the last few years (Hossack 2003). With more than 3,000 wetlands surveyed, boreal toads were found reproducing at only 3 percent of these sites, with a maximum of only 10 females at any one site. On the refuge, upwards of 40 breeding females have been found at Lower Moose Pond, and more than 200 breeding females have been found on the south side of Dahl Lake. The refuge has the largest known population, by far, for the Rocky Mountains.

The Pleasant Valley Creek restoration project would benefit native fish restoration as well. However, for fish restoration to succeed, efforts for fish passage would have to be evaluated and developed on parts of the creek off the refuge as well. A large portion of the off-refuge stream is the downstream section that also has a WRP easement, similar to the WRP easement on the refuge. Working with NRCS, MFWP, and private landowners could make this project a highlight of restoring native fish, as well as other members of the ecosystem such as calliope hummingbird, willow flycatcher, otter, beaver, and moose.

Restoration is always expensive. The refuge has had multiple entities requesting information about the restoration effort on Pleasant Valley Creek. Many of these potential partners have offered to provide funding and expertise, as well as help to find additional funding sources. The refuge would continue to work with these groups and liaison with NRCS regarding funding needs to produce a restoration effort that would contribute a quality conservation effort for riparian habitat, migratory birds, and native fish.

Rationale 4 (alternatives A, B, and C): Aspen groves are an important component of the diverse habitat types and provide food and nesting habitat for a variety of wildlife. Aspens are important for stabilizing soil and watersheds. Healthy stands of trees, shrub, and herbaceous understories, and the litter of aspen stands provide nearly 100 percent soil cover. Soil cover and the intermixture of herbaceous and woody roots protect soil, except during very intense rains (DeByle 1985b).

A bald eagle has nested in the aspens on the north side of Dahl Lake for the last several years. Many migratory songbirds and woodpeckers use aspen for foraging and nesting habitat, especially moist aspen sites where avian species diversity tends to be higher than stands on dry sites (DeByle 1985a). Ruffed grouse use aspen communities extensively for an abundant and nutritious food source, as well as for courting, breeding, and nesting sites (DeByle 1985a). Young aspen provide browse for elk and deer, especially valuable during fall and winter, when protein levels are high relative to other browse species (Tew 1970), and for summer shade and thermal cover in winter. Moose use aspen in summer and winter (DeByle 1985a).

Monitoring of aspen stands would alert managers of when action is needed to maintain the stands. Prescribed fire is one method of promoting quaking aspen and keeping conifers from succeeding.

“Burning increases soil pH and adds organic carbon and nutrient to the soil. However, fire will probably not rejuvenate the stand if quaking aspen biomass is so low that burning does not appreciably raise soil pH and nutrient levels. Sucker vigor will probably be low.”
(Howard 1996; Tirmenstein 1988).

Aspen regenerate from seed and by sprouting from the roots. Germination and seedling survival require a moist, mineral seedbed with adequate drainage, moderate temperature, and freedom from competition (McDonough 1979). Monitoring may be needed if it looks like ungulate overbrowsing is impacting regeneration efforts.

Rationale 5 (alternatives A and B): Much of western riparian habitat has been lost or degraded due to flood control, irrigation projects (Hendrickson and Kubly 1984), grazing (Bock 1993), logging, and housing development. Riparian shrublands consist of tall shrubs such as alder, willow, birch, and dogwood. This habitat is important because it provides foraging and nesting habitat for a diverse set of migratory birds, including many priority species identified by the MPIF (e.g., willow flycatcher, gray catbird, warbling vireo, MacGillivray’s warbler, and lazuli bunting).

As the Montana Bird Conservation Plan points out, this habitat is also used by common species such as song sparrows, which should respond quickly to restoration efforts. Such efforts and results could be highlighted in public outreach efforts to illustrate the concept of “keeping common birds common.” (Casey 2000).

Rationale 6 (alternative B): Preliminary sampling was conducted on the refuge by the MPC in 1996 to determine the extent of the fisheries resource. The dissolved oxygen in Pleasant Valley Creek is sufficient to support a cold-water fishery. The only fish sampled were downstream of USDA Forest Service road 1019. They included the redband shiner, northern pike minnow, yellow perch, pumpkinseed, and suckers. Stunting characteristics were observed in all fish populations except redband shiners and suckers (Mabbott 1996). The sampling report recommends introducing redband and westslope cutthroat trout.

Columbia River redband trout, a subspecies of rainbow trout (*Oncorhynchus mykiss*) is native to the Columbia River drainage. It is considered a species of special concern by the Service, American Fisheries Society, and all states throughout the trout’s historical range (Idaho, Oregon, Washington, Nevada, California, and Montana). The redband trout is classified as a sensitive species by the

USDA Forest Service and the Bureau of Land Management.

In 1994, the Biodiversity Legal Fund of Colorado and a private individual from Kalispell formally petitioned the Service to consider the Kootenai River population of redband trout as an endangered species; the petition was dismissed due to lack of information (Muhlfield 2001). It is believed that, historically, redband trout were in Pleasant Valley Creek, but current water temperature is too high and there has been too much siltation. Redband trout can be found downstream in the Fisher River.

Adult redband trout use deep microhabitats (>0.4 meter) with low to moderate velocities (<0.5 meter per second), while young trout select slow water (<0.1 meter per second) and shallow depths (<0.2 meter) (Muhlfield 2001).

Westslope cutthroat trout (*Oncorhynchus clarki lewisi*) is native to Montana. Its spawning and rearing streams tend to be cold, nutrient-poor, pool habitat, and more cover than uniform, simple habitat (Gardner 2001). To survive the winter, adults need slow-moving pools that do not fill with ice (Brown and Mackay 1995). Loss of habitat is the trout’s main problem, due to loss of stream water to irrigation and barriers created by dams and road culverts (Gardner 2001).

Bull trout are native to Montana and are federally listed as threatened. This trout requires water that is especially cold (<64° F) and clean. Logging and overgrazing are detrimental to their habitat; these management practices remove riparian vegetation, which reduces stream cover and leads to increased temperatures. These practices also increase runoff, which adds sediment loads.

“Bull Trout Interim Conservation Guidance” (USFWS 1998a) has an objective for maintaining or restoring cold-water temperature contributions of non-fish-bearing tributaries. The guidance also calls for discontinuing diversions that result in thermal barriers to passage or increased water temperatures. The ponds on Pleasant Valley Creek could be contributing to increased temperature by spreading and holding the water in one spot.

Rationale 7 (alternative D): The NRCS purchased a wetland reserve easement from the MPC for the entire section of Pleasant Valley Creek on the refuge. The WRP has the following goals that relate to the Pleasant Valley Creek habitat:

- Address habitat needs for a diversity of fish and wildlife with a priority for species most impacted by degraded condition, beaver, moose, and those of ESA concern such as bull trout, westslope cutthroat trout, and redband trout.
- Restore wetland hydrology and vegetation to historical conditions.

- Restore streams to historic channels and function, where feasible.
- Restore fisheries habitat and aid fish passage to tributary channels, where feasible.

Pleasant Valley Creek is a tributary of the Fisher River. Fisher River is an important site for bull trout; therefore, Pleasant Valley Creek can contribute to the system as a non-fish-bearing tributary. Pleasant Valley Creek does not currently support any of the above-mentioned fish species (Mabbot 1996, Hensler 2001).

Pleasant Valley Creek has been channelized and a large portion does not have native, woody, streambank vegetation. Subsequently, MFWP has sampled the stream and found high water temperatures and heavy siltation. Plans are in draft form to improve the stream channel to create or enhance fish habitat by restoring sinuosity on the south end where it was channelized and straightened. There are also sections along the stream where the channel would be revegetated with herbaceous and woody wetland plants. Revegetation would provide bank stabilization and cover that should help decrease water temperatures. Woody vegetation (such as alders, willows, and hawthorn) would also contribute to habitat for many passerines including the willow flycatcher, a species of concern for MPIF. These projects are scheduled for 2003–2007.

Restoration is always expensive. The refuge has had multiple entities requesting information about the restoration effort on Pleasant Valley Creek. Many of these potential partners have offered to provide funding and expertise, as well as help to find additional funding sources. The refuge would continue to work with these groups and liaison with NRCS regarding funding needs to produce a restoration effort that would contribute a quality conservation effort of riparian habitat, migratory birds, and native fish.

WETLAND HABITAT

Rationale 8 (all alternatives): Dahl Lake is a natural lake that spills over to the west in high water years into the surrounding wetland complex. This complex is a system that naturally fluctuated in water level seasonally and yearly, creating an array of temporary, seasonal, and semipermanent wetlands.

The NWI data (1982) for the Dahl Lake complex designated the following:

- 182 acres of open water
- 80 acres of semipermanent wetlands (water through spring and summer and frequently into fall and winter)

- 432 acres of seasonal wetlands (water in spring and early summer but generally dry by late summer and early fall)
- 376 acres of temporary wetlands (water for only a few weeks after snowmelt and few days after heavy rainstorms)

Around 1940, the natural spillway was channelized and directed through a ditch system (named Meadow Creek) to reduce the lake to lower levels and dry the surrounding wet meadows to increase hay pasture. Meadow Creek extends westward through the valley from the western end of Dahl Lake. Portions of this creek were channelized and, more recently, dredged in an effort to increase water flow efficiency for irrigation. Historical and recent aerial photos show the area as a wetland complex of temporary and seasonal wetlands, with seepage and some overflow heading out of the west end of the complex and north across the county road before it turns back north. The Service would work closely with NRCS on restoration of the Meadow Creek area back to a wetland complex, since it continues west off of the east mitigative parcel onto the NRCS's wetland reserve easement.

Filling in the drain ditch out of the west end of Dahl Lake would affect the type of wetlands in the complex for seasonality (temporary and seasonal versus semipermanent) and amount of emergent vegetation. With the drain ditch filled in, the lake should fill to cover greater amounts of surface acreage and spill over to the west end to restore the wetland complex. The wetland complex would be able to fluctuate with natural variations in available water. There would be an increase of at least 200 acres of temporary wetlands. Water would be held longer to restore current temporary wetlands back to seasonal and semipermanent.

Water levels should increase gradually to avoid scouring turbidity and plant mortality (Weller 1981). The complex should refill slowly and with naturally occurring runoff and collection and, therefore, should not increase turbidity or reduce seed stocks for establishing emergent vegetation (Weller et al. 1991). Wildlife would benefit from an increase in foraging and nesting habitat if the natural ecosystem functioning and wetland complex of Dahl Lake is restored.

Temporary wetlands are important for breeding waterfowl, especially early nesters such as mallards and teal, because they provide isolation and spacing. In addition, their shallow waters warm rapidly, providing the first invertebrate food resources in spring (Swanson et al. 1974, Baldassarre and Bolen 1994). However, seasonal wetlands also provide abundant invertebrate foods and nesting cover for species that nest over water.

Most species exploit different types of wetlands to gain various life history requirements. This illustrates the importance of maintaining a complex

of wetlands. For example, American bitterns nest in shallow (<10 centimeters) water with dense, robust emergents, while trumpeter swans will nest in water >50 centimeters. Both black terns and trumpeter swans need abundant, floating, dead vegetation. Providing a mosaic of wetland types with a healthy, robust, emergent plant community, well-interspersed with open water, would provide habitat for a diversity of water birds.

Restoring the wetlands and Dahl Lake wetland complex, and constructing islands, would increase wildlife habitat—as well as comply with the habitat development plan, which is a result of a FERC-approved settlement between the Department of the Interior, the MPC, and the CSKT. The settlement was for mitigation of habitat and wildlife losses on the Flathead WPA caused by past and future operations of Kerr Dam by the MPC. The refuge has 3,112 acres because of this mitigation process. The habitat development plan addresses planned habitat enhancements on the refuge per the “Stipulation and Agreement” (December 12, 1997) and the “Order Approving Settlement.” These developments and enhancements are the result of nearly 15 years of study, assessment, planning, and negotiations between the MPC, the CSKT, and the Service.

The Northern Rocky Science Center has expressed an interest in conducting research that would evaluate how western montane wetlands function. These data, in association with NWI classifications, would provide an understanding of how the naturally occurring fluctuations in water levels of Dahl Lake wetland complex function and the response of associated vegetation and wildlife. These data are a critical link between land management decisions and the appropriate response or result. Subsequently, this would foster the restoration of the biological integrity of the refuge, while restoring wetland habitat that has been increased as habitat and food sources for nesting and foraging waterfowl. However, there are no current plans for collaboration with Rocky Mountain Science Center in alternative D.

Rationale 9 (all alternatives): Dahl Lake water levels have been stabilized at a lower level for multiple years to promote drying of the upper portions of the meadow for hay pasture. A consequence of stabilized water levels is promotion of cattail and reed canarygrass growth in the wetland, which can reduce the attractiveness to waterfowl (Smith and Kadlec 1986). Reed canarygrass will often grow into a monoculture reducing species diversity. Although some waterfowl species use reed canarygrass as nesting substrate, it is not a native plant species.

In the past, cattle grazing has kept the reed canarygrass in check to some degree. However, it still has taken over the wetland with approximately 750 acres in units 14 and 19; therefore, some type of control must be attempted. In unit 14, the largest section of *Phalaris* is still interspersed with *Carex*,

and therefore, hopefully has a chance at restoration to native species.

Rationale 10 (all alternatives): Many of the wetlands were drained in the interest of promoting hay pasture. The reduction of surface water and loss of wetland vegetation is not as conducive to waterfowl and other water bird use. Many of the wetlands can be manipulated back to a basin that can discharge and recharge on a seasonal basis. One wetland (near office headquarters) does not need dirt work, just installation of a water control structure. Naturally occurring runoff should be adequate to fill wetland basins. However, water control structures would allow the maximum flexibility to manipulate water. As wetlands return to a normal seasonal fluctuation, wetland vegetation should reestablish without further manipulation.

These wetlands are classified as semipermanent and seasonal, which with recharge and time, should provide invertebrate foods and emergent vegetation for foraging habitat and nesting and brood cover.

Rationale 11 (alternatives A, B, and C): Fens are sedge-dominated emergent wetlands in northern regions that have an underlying layer of peat covered with many species of mosses and aquatic macrophytes. A fen is similar to a bog, but is alkaline rather than acidic with a much higher nutrient content. Fens gain nutrients found in precipitation, surface water, and groundwater, whereas bogs are fed by nutrients in precipitation only (Aerts 1999).

Wet meadows are like fens, but are much more numerous across the country and are dominated by plants including sedges, rushes, and grasses such as reed canarygrass. Fens are special management areas that the Service would like each refuge to inventory for future protection.

Rationale 12 (alternatives A, B, and D): Wetlands with diverse emergent vegetation, interspersed seed-producing annuals, and open water with a submergent vegetation community provide the habitat requirements of many waterfowl and water bird species (Cowardin et al. 1979). The refuge’s primary purpose is for migratory birds, with emphasis on waterfowl and other water birds. Emergent vegetation (e.g., *Typha*, *Scirpus*, and *Juncus*) is critical to successfully raising a brood—from use as foraging habitat to escape cover. Submergent vegetation such as *Potamogeton*, *Mentha*, and *Equisetum* provides seeds and the substrate necessary for invertebrate populations to grow and provide food to waterfowl.

While there are some differences among waterfowl—such as mallards’ preference for abundant emergent vegetation, while gadwall broods use more open water—the variety of wetlands should provide enough interspersed open water to emergent vegetation to meet the needs of many species. Other

water birds such as black terns, American bitterns, and grebes, along with mammals such as moose and mink, would provide maximum wildlife-viewing and photography opportunities.

Rationale 13 (alternative A): Kilbride and Paveglio (1999) described a four-step method of controlling reed canarygrass that included a late spring application of herbicide (Rodeo), disking in summer, application of herbicide the next growing season, and inundation with water until mid-June. However, with early high-water levels, this method may not be appropriate. It would also be dependent on how much area can be disked. Further review of the literature and speaking with experts would provide the best management practice available.

Many water birds use the emergent vegetation of the Dahl Lake wetland complex. A colony of black terns (Montana species of concern), has been nesting in this area along with other species such as American bittern, sora, (potentially) Virginia rail, and redheads. Although some bird species will nest in reed canarygrass, native plant species diversity would be increased with species such as cattail and bulrush, along with a variety of wetland plants such as *Carex*, *Scirpus*, *Juncus*, *Typha*, *Mentha*, and *Potamogeton*. These wetland plant species would increase food and nesting substrates for a greater diversity of wildlife.

Rationale 14 (alternative B): Restoration of wetlands should also increase the number of waterfowl, which may enable the refuge to provide a quality waterfowl hunt.

Rationale 15 (alternative B): Wild rice has been shown to attract and concentrate large numbers of breeding waterfowl and may increase nest success and duckling survival (Peden 1977, Huseby et al. 2001). In areas of reed canarygrass, wild rice plantings can be used to maximize local production, and increase hunting and wildlife-viewing and photography opportunities.

Rationale 16 (alternative C): Native species restoration is the management priority for alternative C, and the managers would like to complete the restoration without herbicide. Restoration in reed canarygrass areas may release the *Carex* and other native species and provide a good chance at restoration success. As native plant species recolonize the area, it would also increase the diversity of plant species, which would lead to more diverse food sources. The subsequent wildlife diversity, as well as abundance, could increase with the increase in food.

Rationale 17 (alternative D): To stop reed canarygrass from taking over the entire wetland complex, some type of control must be attempted. Many water birds use the emergent vegetation of the Dahl Lake wetland complex. A colony of black

terns (Montana species of concern) has been nesting in this area along with other species such as American bittern, sora, (potentially) Virginia rail, and redheads. Though some bird species will nest in reed canarygrass, native plant species diversity would be increased with species such as cattail and bulrush along with a variety of wetland plants such as *Carex*, *Mentha*, and *Potamogeton*. These wetland plant species increase food and nesting substrates for a greater diversity of wildlife.

GRASSLAND HABITAT

Rationale 18 (all alternatives): The habitat development plan is a result of a FERC-approved settlement between the Department of the Interior, the MPC, and the CSKT for mitigation of habitat and wildlife losses on Flathead WPA caused by past and future operations of Kerr Dam by the MPC. The refuge has 3,112 acres because of this mitigation process. The habitat development plan addresses planned habitat enhancements on the refuge per the “Stipulation and Agreement” (December 12, 1997) and the “Order Approving Settlement.” These developments and enhancements are the result of nearly 15 years of study, assessment, planning, and negotiations between the MPC, the CSKT, and the Service.

The refuge is surrounded by PCTC lands that are open to public use and grazing leases. Many individuals hunt, mountain bike, and horseback in the area. These uses are not allowed on the refuge. The public needs to understand when they are on the refuge so that they stay in compliance with regulations. Boundary fencing is needed in areas of grazing leases to prohibit trespass grazing.

Rationale 19 (all alternatives): Management success for specific plant communities is dependent on soil type. The soils layer has been defined for the refuge; however, many of the soil types are unique to the area and have not been classified. NRCS can classify the soil types with sampling and through literature review of associated plant communities. This information is crucial for determining whether a particular plant community can be achieved with a management practice. It may also help explain or understand invasive plant control efforts or encroachment and native plant restoration.

Rationale 20 (all alternatives): Cumulative impacts from grazing can occur by heavy grazing leading to replacement of Idaho fescue with invasive species such as cheatgrass (Mueggler 1984) and knapweed (Olson and Wallander 1997), and can adversely affect soil fertility. Rough fescue is a highly palatable species and is extremely susceptible to grazing and trampling damage. Two to three summers of heavy grazing can effectively eliminate plants from sites (Johnston and MacDonald 1967). Continued close grazing greatly

lowers vigor and eventually results in death of the plant (Johnston and MacDonald 1967).

Recovery from overgrazing is slow due to erratic seed production and limited tilling abilities (Johnston and MacDonald 1967). However, light grazing does not reduce overall plant vigor (Johnston 1961, Mueggler and Stewart 1980). As with Idaho fescue, it is suggested that a carryover of 40–50 percent of the current year’s growth of rough fescue and 20 percent of the seed stalks would maintain plant vigor.

Maintenance of grasslands in the Intermountain West is dependent on periodic fires to remove dry matter and invading shrubs and trees. The fire interval historically was quite variable. Using prescribed fire at 10- to 25-year intervals has neutral to negative effects on Idaho fescue (Antos et al. 1983, Arno and Gruell 1986). Fire effects vary with condition and size of the plant, season, and severity of fire, and ecological conditions.

Idaho fescue has been reported to be more sensitive to fire than bluebunch wheatgrass (Conrad and Poulton 1966). Rough fescue seems to be well adapted to periodic use of prescribed fire. Spring and late fall burns on Idaho and rough fescue sites with good soil moisture, during plant dormancy, and with favorable Idaho fescue root reserves are thought to injure plants less; yet late-season burning results are varied for both fescues (USDA Forest Service fire effects information system database). Spring burns should be conducted as soon after snowmelt as possible to minimize fire damage. Spring burns after new growth has initiated on western wheatgrass can severely injure this species (Volland and Dell 1981).

Fire effects are varied also with respect to increase in vigor. Vigor has been seen to return in 2–5 years for Idaho and rough fescue and western wheatgrass, with an increase in protein content for Idaho fescue (Launchbaugh 1964, Phillips 1973, Stubbendieck et al. 1986, Singer and Harter 1996). Western wheatgrass increases in abundance and density after a fire. Drastic reductions in rough fescue seed production are also possible following spring burning (Bailey and Anderson 1978).

Prescribed fire frequencies of 5–10 years are recommended for mountain grassland sites where management objectives are aimed at rough fescue maintenance.

Rationale 21 (all alternatives): Monitoring for flora and fauna response to land management would provide feedback crucial for determining whether management efforts are achieving their desired outcome. This adaptive approach provides a prescriptive process rather than crisis management. Species would be better provided for in a manner

that is driven with a purpose—leading to better chance of success and use of funds and time.

Rationale 22 (alternatives A and B): Upland grasslands and one unit of bottomland grasslands (figure 2; management units 11, 12, 13, 14, 19) surround the Dahl Lake wetland complex. These grasslands would be managed for waterfowl-nesting habitat based on their location and grass species. Though waterfowl hunting is not allowed, the Service is working towards improving waterfowl habitat and the potential to provide hunting in the future. These grasslands are native and tame grasses, but the *Alopecurus* is not considered in the objective acreages, since another objective is restoring it to native species.

It has long been established that vegetation structure and litter are what species key into for nest site selection rather than species composition (Cody 1968, Wiens 1969, Kantrud and Higgins 1992). Therefore, it is acceptable to work with tame grasses for ground-nesting birds. However, with initiatives such as “Bring Back the Natives,” refuges are putting more effort into maintaining and working with native plant communities when possible and feasible. To achieve and maintain the above-stated desired vegetative condition, short-term management practices (e.g., grazing or fire) would be used to remove decadent, residual vegetation [every 5–7 years (Kirsch et al. 1978), 6–7 years (Gilbert and Woodling 1996), or 5–10 years (Barker et al. 1990) depending on productivity, precipitation, and vegetation-monitoring results].

Maintaining vigorous, medium-tall grassland around Dahl Lake would provide waterfowl nesting habitat along with benefits to other species such as the short-eared owl, savannah sparrow, meadowlark, and northern harrier. The public would be able to enjoy increased opportunities for wildlife observation and photography, due to increased use by birds and other species such as moose, elk, and bear.

Rationale 23 (alternative A): Upland grasslands overlay rolling topography that grades into forest habitat and encompass approximately 1,500 acres. The majority of the upland grassland areas are native grasses. Native bunchgrass prairie is an important habitat coverage that is limited in the northwest. The refuge has a substantial tract that can be conserved for use by native wildlife species and public use, including environmental education. Upland habitat restoration is also part of staying in compliance with the habitat development plan.

The refuge was a working cattle ranch prior to refuge establishment and some areas have been overgrazed, which has led to areas with invasive plants and sparse vegetation with low productivity. Impact of defoliation on plant vigor is depression of herbage and flower stalk production. For vigor to

recover in grassland species such as Idaho fescue, areas of extremely poor vigor may need 6–7 years of rest, while bluebunch wheatgrass can take up to 10 years (Mueggler 1975). In areas of intermediate vigor, Idaho fescue may be able to recover after 3 years of protection (Mueggler 1975). Resting would allow management to determine grassland conditions for plant species composition and vigor (cover, height, and productivity).

The best management practices with the use of rest, prescribed fire, and grazing can be developed based on evaluating which tool at a particular timing would maintain native, vigorous bunchgrass uplands for nesting migratory birds and forage for other wildlife. Grazing would need to be used cautiously with either none, or limited to light grazing after the growing season, for maintenance of cool-season bunchgrass areas.

Repeated grazing may reduce the ability of Idaho fescue to compete with spotted knapweed when both are grazed (Olson and Wallander 1997), and grass defoliation in spring increases spotted knapweed cover compared to summer defoliations (Jacobs and Sheley 1999).

Rationale 24 (alternative A): The refuge and WRP easement south of the county road has a wide diversity of sedges, native grasses, and forest. With rest, native fescue would continue to recover vigor, depending on precipitation. Once vegetation targets are met, some disturbance would be required to maintain vigor, unless native herbivores are concentrating in these areas. Close monitoring and collaboration with NRCS is required, as well as interagency permission to conduct management practices on these easement tracts.

Rationale 25 (alternative B): There are more than 1,000 acres of relict, native, bunchgrass prairie that can provide wildlife cover and nesting habitat. Idaho fescue and western wheatgrass have very good to excellent palatability and have good energy value as forage for elk and deer (Mueggler and Stewart 1980). These grasses also provide fair to good cover for nongame birds (Dittberner and Olson 1983, Tirmenstein 1999).

The refuge has a popular big game hunting program and many visitors enjoy birdwatching and photography. Maintaining healthy native grasses would provide a unique setting for the surrounding area visitors to enjoy wildlife in several ways.

Rationale 26 (alternative B): The refuge and WRP easement south of the county road has a wide diversity of sedges, native grasses, and forest. With rest, native fescues would continue to recover vigor depending on precipitation. Once vegetation targets are met, some disturbance would be required to maintain vigor unless native herbivores are concentrating in these areas. Close monitoring and

collaboration with NRCS would be required, as well as interagency permission, to conduct management practices on these easement tracts.

Alternative B would maintain two extensive foot trails, with their use benefiting from maintenance of native grasslands in a vigorous state. Visitors would be able to view native wildlife habitat and the wildlife species associated with them. In addition, vigorous grasslands are more protected against invasive plant seed and undesirable annuals being brought in from visitors.

Rationale 27 (alternatives C and D): Palouse prairie is listed as a critically endangered ecosystem exhibiting a 98 percent decline (Noss et al. 1995), therefore, conservation is necessary. These upland grasslands overlay rolling topography that grades into forest habitat and encompass approximately 1,500 acres. The majority of the upland grassland areas have native grasses. Native bunchgrass prairie is an important habitat coverage that is limited in the northwest. The refuge has a substantial tract that can be conserved for use by native wildlife species and for environmental education. Upland habitat restoration is also part of staying in compliance with the habitat development plan.

The refuge was a working cattle ranch prior to refuge establishment and some areas have been overgrazed, which has led to areas with invasive plants and sparse vegetation with low productivity. For vigor to recover in grassland species such as Idaho fescue, areas of extremely poor vigor may need 6–7 years of rest, while bluebunch wheatgrass can take up to 10 years (Mueggler 1975). In areas of intermediate vigor, Idaho fescue may be able to recover after 3 years of protection (Mueggler 1975). Resting would allow management to determine grassland conditions for plant species composition and vigor (cover, height, and productivity).

Vigor must be returned to accomplish productivity needed to regain the native, climax community (native plants in their “correct” percent compositions).

Rest from cattle grazing would allow managers to determine current grassland conditions. For alternative D, future management efforts can then be developed based on evaluating which plant communities and areas have the greatest biological potential to be managed for a group of wildlife species.

The best management practices with the use of rest, prescribed fire, and grazing can be developed based on evaluating which tool at a particular timing would maintain native, vigorous bunchgrass uplands for nesting migratory birds and forage for other wildlife.

Rationale 28 (alternative D): Refuge managers cannot manage for everything and must prioritize species for which the habitat would be manipulated. To provide for priority species, a review must be conducted on the habitat requirements, which are then used as outcomes for habitat management. Once managers develop the habitat outcomes desired, a plan would be put together for how best to achieve the habitat outcomes using the various land management tools (rest, grazing, prescribed fire, or haying). Establishing an outcome, as well as how best to achieve it, is critical to saving money and effort in the long run.

FOREST HABITAT

Rationale 29 (all alternatives): Initial efforts to classify the forests on the refuge combined the largest area possible for dominant tree species, and other available habitat types within large forest areas may be missing.

Several wildlife species of concern could be using forest habitats. Forest habitat is not a priority for refuge management, however, as wildlife stewards, the Service should still determine what is within their boundaries, and not conduct any management that would hinder species of concern and their biological potential.

Bald eagles are nesting in aspen forest and golden eagles are nesting in Douglas-fir forest. Olive-sided flycatchers, flammulated owls, and black-backed woodpeckers are priority species (level 1) for the MPIF program. They are found in open-canopy woodlands, open-canopy ponderosa pine, and closed-canopy lodgepole pine, respectively. Olive-sided flycatchers have been recorded to occur on the refuge.

Yellow-billed cuckoos are a federal candidate species that could be using the cottonwood–aspen woodland associations. Grizzly bears and wolves are known to occur in the surrounding forested area, and Canada lynx could potentially be using the refuge as a corridor or foraging through the area.

Since there are no resources available to conduct forest management to improve the habitats for any of these species, management actions would be monitored and reviewed to not hinder the use of these habitats by these species.

Rationale 30 (all alternatives): The historical aspect of the lack of fire has resulted in a fire-intolerant species that increases susceptibility to severe wildland fires, shifts composition toward the more shade-tolerant Douglas-fir, and contributes to the loss of wildlife forage (Smith and Arno 1999). Arno and Smith (1999) recommend reversing this trend by reintroducing low-intensity wildland fires through the use of prescribed fire in conjunction with partial cutting or thinning.

Rationale 31 (alternative A): There is not enough forested habitat to provide all life requirements for species such as the grizzly bear, gray wolf, and Canada lynx. However, with the large tracts of adjacent USDA Forest Service and PCTC lands, the refuge could provide an important linkage area for these species.

Rationale 32 (alternative A): Stands of large ponderosa pine historically dominated most dry forest sites in western Montana. These dry forests are composed of a mix of ponderosa pine and Douglas-fir. Logging and fire suppression have resulted in an alteration of age class structure, physical structure, tree density, and tree species composition (Barrett 1979, Schubert 1974, Shepperd et al. 1983). Large, old-growth trees in open settings have been replaced with dense stands of younger trees.

Many priority bird species—such as the Lewis’s woodpecker, pileated woodpecker, olive-sided flycatcher, flammulated owl, white-breasted nuthatch, and Williamson’s sapsucker (all noted on the refuge)—are closely associated with old forest stages and snags. Regional populations of these species have decreased due to the reduction of old forest stages.

Other species that are favored by the public such as elk and deer should benefit as well. Elk live in high elevations in semi-open forests and mountain meadows during the summer. In the winter, elk migrate to lower sheltered valleys, windswept meadows, and lower wooded slopes. Tree lichen is important forage for deer and elk during winter (Baty et al. 1996). Typical diet consists of mainly grasses, sedges, and forbs. The refuge may be able to provide more old-growth habitat to foster these species.

Rationale 33 (alternative B): A large wintering elk and deer population use the dry forest areas composed of a mix of ponderosa pine and Douglas-fir. Logging and fire suppression has resulted in an alteration of age class structure, physical structure, tree density, and tree species composition (Barrett 1979, Schubert 1974, Shepperd et al. 1983). Elk live in high elevations in semi-open forests and mountain meadows during the summer. In the winter, elk migrate to lower sheltered valleys, windswept meadows, and lower wooded slopes. Tree lichen is important forage for deer and elk during winter (Baty et al. 1996). Typical diet consists of mainly grasses, sedges, and forbs.

The open foraging areas of large, old-growth trees have been replaced with dense stands of younger trees. Halting Douglas-fir encroachment or young even-aged stands would favor elk and deer, while maintaining some of these areas to benefit them in the winter for thermal cover. Other species that the public like to observe includes many priority bird species associated with old forest stages such as the

Lewis's woodpecker, pileated woodpecker, olive-sided flycatcher, and flammulated owl.

Rationale 34 (alternative B): Turkeys are not indigenous to Montana and are not a priority species for management consideration; however, they are a popular game species and are considered for habitat management to serve the public. Wild Merriam's turkeys were transplanted to Pleasant Valley in 1999. Merriam's turkeys are associated with ponderosa pine, lodgepole pine, and Douglas-fir near edges, which provide open areas for feeding, mating, and habitat (MacDonald and Jantzen 1967). They use forested areas as cover from predators and for roosting in trees at night. Open areas provide a greater abundance of insects to young poults and females.

A varied habitat of both open and covered area is essential for survival of wild turkeys. Most sightings of turkey have been associated with mixed-conifer and hardwood areas and meadows surrounding the Dahl Lake complex.

Turkey hunting is open in fall and spring, except within the bottomlands between south of the county road and north of south Pleasant Valley Road.

Rationale 35 (alternative D): Resources do not currently exist to conduct forest management. Until further staff is on site, it would be impossible to determine the best management practices for forest habitat. Limitations with staff and equipment hamper the refuge's ability to develop objectives and use management tools such as restoration, prescribed fire, thinning, or removal. Alternative D has no migratory bird priorities established for species that use forest habitat.

INVASIVE PLANTS

Rationale 36 (all alternatives): The presence of invasive plants can alter the functioning of ecosystems by loss of wildlife habitat, displacement of native species, change in carrying capacity from reducing forage production, lowered plant diversity, and increased soil erosion and sedimentation.

These negative effects from invasive plants require control, which includes chemical, biological, and hand pulling for tansy ragwort, spotted knapweed, and sulfur cinquefoil to maintain native grasses and Spalding's catchfly.

Herbicide use for invasive plants would decrease the ability of these plants to outcompete the grasses and native forbs for light, water, nutrients, and pollinators.

Herbicide use would be distributed throughout the refuge and applied at the rate according to the label. Spraying would be monitored. There should be no detrimental effect from too much herbicide in one location. A negative effect could occur from care not

being taken where aerial spray of Tordon drifts onto forested areas and young trees are killed. If any, only negligible impacts should occur from herbicide use in the water systems due to application following label guidelines and refuge policy.

Care must be taken with prescribed fire in areas of invasive plants. Judicious removal of invasive plants needs to be conducted at least 2 years prior to use of prescribed fire to prevent seed production and dispersal (Goodwin 2001). Otherwise, prescribed fire could increase the coverage of invasive plants and reduce native grasses and forbs. Prescribed fire may have to be prohibited in areas of dense occurrence of invasive plants (with low to absent desired plant cover), to prevent rapid and expanded growth of invasive plants due to fire-produced disturbances. This approach of careful control prior to burning should have great positive benefits for reinvigorating and increasing Spalding's catchfly habitat.

Rationale 37 (all alternatives): Invasive plant control is a legal and popular issue for many national wildlife refuges, as well as required to be in compliance with the habitat development plan. The primary reason for control is that invasive plants displace native vegetation and impact wildlife by reducing availability of forage, cover, and nesting sites.

The refuge has not yet been inundated with a large number of invasive plant species. Spotted knapweed and tansy ragwort are the two most common and noticeable invasive plants. Sulfur cinquefoil exists intermingled with the native cinquefoil, so the extent of this problem has yet to be defined. Spotted knapweed is fairly dispersed and needs to have priority for control efforts to keep it from becoming dominant. Tansy ragwort is a new, encroaching invasive plant on that is in many isolated pockets; eradication may still be possible if heavy effort is put into early control. The refuge will continue in partnership with the working group that has been established for working on tansy ragwort control within the area.

Invasive plant control is costly in both time and money. Successful control requires careful planning, implementation, and monitoring as defined by. Past efforts and current infestation levels would be evaluated and monitored for effectiveness. This needs to be done to demonstrate that time and effort are not wasted. Chemical and biological control are the two most common control methods used on these invasive plants. However, careful application of chemicals would be essential to produce the desired result for native vegetation composition.

Biological control would need to be evaluated for the benefits and impacts to determine whether a nonnative species should be introduced on refuge lands.

- Determine if a biological control would switch from the target invasive plant to a native species.

- Determine demonstrated success in other areas with limiting or eradicating encroachment.
- Determine that a biological control would not alter or disrupt the native insect community, especially in regards to native pollinators.

Biocontrol agents have been shown to reduce the spread of invasive plants. However, controversy exists over whether there are direct effects of biological control on nontarget species, as well as indirect effects.

Pearson et al. (2000) demonstrated that the establishment of the biological control agent, *Urophora* spp., altered deer mouse diets and habitat selection by effecting changes in foraging strategies. This could result in spiraling changes to the food web. For example, a small mammal population increase could be followed by an increase in raptors, foxes, and skunks. These species also prey on ground-nesting migratory birds. On the other hand, increases in small mammals have been shown to result in less nest predation because predators are using the small mammals as alternative prey. However, high populations of small mammals can result in increased ground disturbance from tunneling, which often creates perfect sites for dispersal of invasive plants.

Spotted knapweed is the primary invasive plant found on the refuge. Invasive plants have undergone extensive range expansion and often create dense stands that turn native plant communities into invasive plant wastelands. The presence of invasive plants can alter the functioning of ecosystems by loss of wildlife habitat, displacement of native species, change in carrying capacity from reduced forage production, lowered plant diversity, and increased soil erosion and sedimentation.

Spotted knapweed aggressively invades grassland and early successional forest sites (Rice et al. 1997a). As spotted knapweed increases on a site, other species decline, with up to a 60–90 percent decrease in graminoid production (Harris and Cranston 1979, Bucher 1984, Morris and Bedunah 1984).

With limited staffing, the staff of the refuge complex would have to provide collateral effort for invasive plant control, as it has been able to do since establishment of the refuge, until a maintenance worker and biologist are added. This would limit the control effort to the stated, annual average of 200–400 acres. The refuge would continue to explore opportunities for grants and partnerships for additional invasive plant control and volunteer recruitment to maintain or expand control efforts.

Rationale 38 (all alternatives): Cumulative impacts from grazing can occur by heavy grazing leading to replacement of Idaho fescue with invasive species such as cheatgrass (Mueggler 1984) and knapweed (Olson and Wallander 1997), and can adversely affect

soil fertility. Rough fescue is a highly palatable species and is extremely susceptible to grazing and trampling damage. Two to three summers of heavy grazing can effectively eliminate plants from sites (Johnston and MacDonald 1967). Continued close grazing greatly lowers vigor and eventually results in death of the plant (Johnston and MacDonald 1967).

Rationale 39 (alternatives A, B, and C): The refuge has 1,000 acres of *Alopecurus*. This species is palatable, but a poor-nutrition forage grass for big game; while it can provide some nesting cover for waterfowl (Hitchcock 1971). These species are often seeded with timothy (*Phleum pratense*); plant diversity is reduced by the vigorous spread and domination of the occupied area. Control would require elimination along with simultaneous introduction of a desirable competitor (Weaver et al. 1990). These areas are temporarily flooded wet meadows (USFWS 1982) with many sedges already interspersed throughout the areas adjacent to native grasses.

A partnership is already established with NRCS for the WRP easement. The WRP easement has plans for native plant restoration. Restoration efforts are often costly and time consuming; the feasibility of restoring all tracts of *Alopecurus* is likely cost-prohibitive. The collaboration of the Service and NRCS should provide quicker results with greater cost efficiency than by working alone, hence a priority for areas within the WRP easement. Future efforts can be placed toward the remaining bottomland areas adjacent to the WRP easement and finishing with the areas in the more upland sites.

Rationale 40 (alternative A): The refuge was a working cattle ranch prior to refuge establishment and some areas have been overgrazed, which has led to areas with invasive plants and sparse vegetation with low productivity. Repeated grazing may reduce the ability of Idaho fescue to compete with spotted knapweed when both are grazed (Olson and Wallander 1997), and grass defoliation in spring increases spotted knapweed cover compared to summer defoliations (Jacobs and Sheley 1999).

Rationale 41 (alternative B): While the WRP easement would have priority for restoration of *Alopecurus* areas, other areas of *Alopecurus* would remain and be maintained for waterfowl-nesting habitat and other wildlife forage.

MIGRATORY BIRDS

WATER BIRDS

Rationale 42 (all alternatives): Disturbance can negatively affect waterfowl production by decreasing the number of breeding pairs, hatching success, and survival of the young. Disturbance during pair bonding, and nest building and initiation can cause

waterfowl to nest elsewhere or not at all. Several studies have identified human disturbance as the cause of desertion or abandonment of nests, especially during early incubation (Korschgen and Dahlgren 1992). Nest success can be affected by flushing hens away from the nest, leaving the eggs exposed to predators and the elements. Human-created trails and markers may also increase predation rates on hens and eggs. Disturbance during brood rearing may break up and scatter broods leaving them vulnerable to predation, exposure, and starvation.

Disturbance would be limited to increase production and survival. Human-induced increases in predation are a severe problem for breeding shorebirds in the Intermountain West (Oring et al. 2003). Shorebirds have higher metabolic rates than do birds of similar size (Wilson 1991). They are less likely to tolerate poor quality food. The effects of disturbance on shorebirds include reduced foraging time due to displacement and reduced food supply due to compaction of substrate (Hamann et al. 1999).

At Bosque del Apache National Wildlife Refuge (New Mexico), waterfowl increased nitrogen levels by 40 percent and phosphorus levels by 75 percent in the winter of 1995–1996 (Post et al. 1998).

To evaluate production and how management practices are affecting it, an index from pair-count surveys is used. Duck pair counts have been conducted on Dahl Lake and other wetlands since establishment of the refuge. Pair counts are conducted once during the nesting season in mid- to late May or early June. Pair-count data would only establish an estimate of how many pairs are nesting. Average brood size, hen success, and survival to fledglings must also be calculated to determine production:

Duck Production =

of pairs x average brood size x nest success
x constant of 0.7 (survival to fledgling)

Rationale 43 (all alternatives): The National Bison Range complex completes three aerial surveys for geese with partners; the CSKT, MFWP, and Avista Utilities. The two surveys that include the refuge are the goose pair count and goose brood survey. The midwinter waterfowl survey is not conducted on the refuge due to early ice-over of the wetlands. The pair survey was not conducted for several years, but has been resumed. These data are important to evaluate population trends from year to year and are used by MFWP for hunting regulations. The brood survey is used to calculate production.

Rationale 44 (alternatives A, B, and C): Wetland-dependant species are important to ecosystem health and many are listed as priority species under the U.S. Shorebird Conservation Plan and the MPIF initiative. These species are difficult to record with

traditional monitoring and general observation. Monitoring such as taped calls may be needed to record their presence. Once monitoring is accomplished, management practices can be developed to promote these species. The refuge would be surveyed to determine the status of shorebirds, marsh birds, and sandhill cranes.

One of the goals of the U.S. Shorebird Conservation Plan is to ensure that adequate quantity and quality of shorebird habitat is maintained at the local level. The conservation plan is split into individual regional plans with the refuge falling in the Intermountain West subregion. By monitoring and protecting shorebird habitat, the refuge can aid the Intermountain West region in obtaining two of their regional goals.

- *Habitat Management Goal:* Maintain and enhance diverse landscapes that sustain thriving shorebird populations.
- *Monitoring and Assessment Goal:* Acquire information on shorebird distribution and abundance for shorebird conservation.

Species of shorebirds known to breed in the northern Rocky Mountains that are listed as priority 3 (important) for conservation value include the black-necked stilt, American avocet, greater yellowlegs, willet, spotted sandpiper, Wilson's phalarope, and common snipe. The long-billed curlew is listed as priority 4 (very important). The snowy plover, killdeer, and upland sandpiper may occur in the area, but are not listed as priority species. Twenty-three additional species occur annually as migrants—6 in moderate numbers and 17 in small numbers.

The American bittern is as a priority 3 species for the MPIF initiative. It is a secretive species, which makes it difficult to monitor and, therefore, hard to determine occurrence and abundance. It is critical to establish distribution of this species and provide protection before they are lost in northwestern Montana. The biological potential exists for bitterns at the refuge, but surveys have not been conducted. Bitterns may nest in reed canarygrass (Dechant et al. 1999) and prefer relatively large (7.4 acres) wetlands.

One of the goals of the refuge as stated in the EA and conceptual management plan (1998) is as follows: to provide optimal feeding and resting habitat for waterfowl, cranes, other migratory water birds, and shorebirds.

At least two pairs of sandhill cranes have been observed during spring and summer. Colts have been observed, so nesting has occurred. Surveys would be conducted to determine nesting density and success.

Young shorebirds are especially vulnerable to mortality from hay cutting. In Harney Basin, Oregon, it was estimated that one operator killed 400–600 shorebirds (primarily Wilson's phalarope)

by mowing between July 1 and July 13 (Oring et al. 2003). Unlike ducks, shorebirds (especially Wilson's phalarope) tend to remain in hay meadows to feed after hatching. Consequently, even the earlier-nesting species are vulnerable to mowing. Bitterns will not tolerate haying, mowing, or grazing during or immediately prior to nesting season.

The emphasis in alternative C is to restore habitat and limit disturbance to develop a self-sustaining functional ecosystem that naturally supports marsh and shorebirds. Monitoring would be conducted to gather baseline information and record changes as habitat restoration is implemented. Disturbance would be limited to increase production and survival.

Rationale 45 (alternatives A and B): Fall populations of waterfowl on the refuge appear to be low compared to other areas in western Montana. Weekly surveys would be conducted to determine base numbers for comparison with similar habitat. The refuge would work with partners and volunteers to conduct surveys of available forage resources. Experts would be consulted or a research project would determine what the limiting factors are to fall waterfowl populations.

A hunt plan was developed in 2001. One of the issues that were raised was to provide opportunities for waterfowl hunting. Waterfowl hunting is not permitted, due to low numbers of ducks and geese using the refuge during hunting season. In the EA for the hunt plan, it was stated that waterfowl populations and habitats would be evaluated in the future to determine the potential for hunting opportunities. The water bird objectives address that promise. Implementation of alternatives A and B includes monitoring the effect that wetland enhancement projects conducted under the habitat development plan and the NRCS restoration project would have on fall waterfowl populations.

In alternative B, a goal to increase waterfowl numbers by 20 percent is included to increase public use opportunities such as wildlife viewing, photography, and hunting. Staff would conduct surveys and consult with experts to determine limiting factors to fall waterfowl numbers and would use adaptive resource management to increase numbers. If forage were determined to be a limiting factor, the development of food plots would be examined.

Rationale 46 (alternative A): Average brood size, hen success, and survival to fledglings must be calculated to determine production. This requires additional staff and partnerships to conduct duck brood surveys and nest dragging. Conducting these surveys on the refuge would more accurately assess production. Nest dragging would be conducted to determine nest success and to ascertain causes of nest failure. This baseline information would be used to develop a waterfowl management plan with a goal of 25–40 percent nest success averaged over 5 years. A

nesting success of approximately 15–20 percent is suggested to maintain stable duck populations. (Cowardin et al. 1985, Greenwood 1986, Klett 1988).

Nest predation by mammals, and to a lesser extent by birds is the major proximate cause of nest failure (Cowardin et al. 1985, Greenwood et al. 1987, Klett et al. 1988). Predation can be limited directly through predator trapping and indirectly through habitat manipulation and expansion to increase nest security. Predator control is often expensive and time consuming; therefore, habitat manipulation would be used to increase nest success, unless continued monitoring suggests that predator control is needed.

Another limiting factor to duck production is forage. Aquatic invertebrates play a critical role in the diet of most female ducks during the breeding season. Ducklings feed on aquatic invertebrates until approximately 1 month old, and then gradually increase consumption of seeds and vegetation. The Dahl Lake wetland complex would be surveyed to determine available forage for female ducks and broods in the spring and early summer. Hens and broods switch to seeds and vegetation later in the summer and fall and these resources would be surveyed.

Rationale 47 (alternative A): Monitoring the effect that wetland enhancement projects conducted under the habitat development plan and the NRCS restoration project would have on fall waterfowl populations would be an important focus. Nest mapping or nest searching would better quantify the effects of restoration efforts. Surveying would more accurately portray species use of the refuge and help determine how best to provide habitat for the life needs of these species.

One of the goals of the U.S. Shorebird Conservation Plan (2000) is to ensure that adequate quantity and quality of shorebird habitat is maintained at the local level. The conservation plan is split into individual regional plans with Lost Trail National Wildlife Refuge falling in the Intermountain West subregion. By monitoring and protecting shorebird habitat, the refuge can aid the Intermountain West region in obtaining two of their regional goals.

- *Habitat Management Goal:* Maintain and enhance diverse landscapes that sustain thriving shorebird populations.
- *Monitoring and Assessment Goal:* Acquire information on shorebird distribution and abundance for shorebird conservation.

Although habitat may be the most important resource necessary to produce ducks, additional factors may also affect production, including predation, lack of suitable food substrate, and human disturbance. Surveys would be developed to determine waterfowl nest success, causes of nest failure, and food

availability. Adaptive resources management would then be applied to increase production.

Rationale 48 (alternative B): Nesting and production would be studied and a waterfowl management plan would be developed. Success would be measured by the number of fledglings produced rather than nest success alone. A goal of 500 was obtained by using an average pair count of 260 (from on-site pair counts conducted in 1999, 2000, and 2002), average nest success of 40 percent (average nest success on the WMD), and average brood size of 4.9 (average brood size on the refuge).

Construction of additional goose and duck nesting structures and islands would be evaluated to increase production.

The quickest and easiest way to measure and evaluate production trends is with nest success. However, other factors may be limiting production such as suitable nesting habitat and available forage. Alternative B considers all these factors to maximize duck production to meet refuge-enabling responsibilities and to provide quality public use.

Rationale 49 (alternative C): Habitat would be restored and nest and brood-rearing areas would be protected from disturbance. Baseline information on nesting and production would be gathered. Monitoring would continue to determine the effects of habitat restoration and ensure that other management activities do not have a negative effect on production. Improving habitat and limiting disturbance should increase production. Predator control would only be used as a last resort.

Rationale 50 (alternative C): Duck populations would be monitored by conducting pair and brood counts on the refuge. Managers would maintain or increase waterfowl populations by restoring habitat and reducing disturbance. Predator control would only be used if severe declines in populations were determined to be a result of depredation.

Alternative C emphasizes restoration of habitats to reestablish the natural ecology. After restoration, active management would be minimal and consist mainly of reestablishment of natural processes such as fire. Monitoring of habitats and wildlife would document change. Disturbance from management and public use would be minimized to encourage natural processes.

Rationale 51 (alternative D): Waterfowl monitoring would consist of annual pair counts. Other production parameters would be obtained from National Bison Range complex data and previous nest-dragging studies. Changes in populations may not be as obvious as in other alternatives where brood counts and nest dragging occurs on the refuge.

Rationale 52 (alternative D): Current staffing levels and management obligations do not allow time for

on-refuge pair counts and surveys of average brood size, hen success, and survival to fledgling. Data on average brood size is calculated yearly by biologists with the National Bison Range complex, through surveys conducted on WPAs in the WMD, and on Ninepipe and Pablo national wildlife refuges. Hen success and survival are constants determined by literature and past nest dragging conducted by the Montana Cooperative Wildlife Research Unit.

The terns, grebes, and cranes are present on the refuge are wetland-dependent species and, therefore, important in refuge management. Current staffing levels are not sufficient to conduct individual surveys on these species; however, it is important to monitor changes through the years. Recording numbers observed on the annual duck pair count and other routine duties would count terns, grebes, and cranes.

Rationale 53 (alternative D): Goose populations and production are high in northwestern Montana; therefore, geese are not a priority species. The goose-nesting structures existed prior to establishment of the refuge. Since they are in good condition and there is not an overabundance of geese in the Pleasant Valley watershed, existing structures would be maintained. No new structures would be built.

OTHER MIGRATORY BIRDS

Rationale 54 (all alternatives): In the past, management decisions were often based on single species or habitats. Recently, preserving ecosystems has been receiving more attention as resource managers recognize the need for a landscape perspective in conservation. Landscape planning is extremely important to the conservation of Neotropical migratory birds (NTMB), since managing a habitat to the benefit of one set of species would inherently be a detriment to other species.

The landscape approach to NTMB management is necessary to ensure there is enough ecological variety to support all native species simultaneously over a broad landscape. Thus, special emphasis can be placed on regionally rare or threatened species and habitats without compromising habitat of more common species.

Long-term conservation of NTMBs cannot be achieved on the refuge level. No refuge is ecologically isolated from activities and conditions in surrounding areas. Population sizes and viability of NTMBs are determined by interactions between local habitat factors and regional or landscape features such as total habitat area and biogeography.

Rationale 55 (alternatives A, B, and D): Western and mountain bluebirds are found in the Pleasant Valley area. Populations of mountain bluebirds declined about 6 percent annually across western North America according to the National Breeding Bird

Survey. Bluebird populations have rebounded since the box program became popular in the 1980s. There has been a significant decrease in natural nesting cavities for bluebirds throughout the country, due to increased urbanization with a corresponding decrease in the number of dead trees and replacement of wooden fence posts with metal. Compounding the problem of habitat loss has been the introduction of two imported species—the house sparrow and the European starling. Both species are cavity nesters that aggressively compete with bluebirds for cavities.

A bluebird box trail was established along the road system in the refuge, in the early spring of 2001. Bluebird boxes were donated and volunteer Erv Davis and the Pleasant Valley School established the trail. The Pleasant Valley School monitors and maintains the boxes. Although bluebirds are not currently a priority species for Montana, the maintenance of this bluebird trail is useful as an educational tool, to interest students and the public in NTMBs and their conservation.

About 85 species of North American birds excavate nesting holes, use natural cavities resulting from decay, or use holes created by other species in dead or deteriorating trees. The absence of suitable nest sites is usually considered the limiting factor for cavity-nesting species (Thomas et al. 1979). The Partners in Flight Montana Bird Conservation Plan includes retention of all large snags and broken-top trees. Management for adequate numbers over the landscape is a critical objective to maintain viable populations of the Lewis's woodpecker and flammulated owl.

Other cavity-nesting priority species in Montana that would benefit from the retention of snags include the black-backed woodpecker, three-toed woodpecker, Williamson's sapsucker, pileated woodpecker, downy woodpecker, red-naped sapsucker, pygmy nuthatch, red-breasted nuthatch, white-breasted nuthatch, hairy woodpecker, and western screech-owl.

Rationale 56 (alternatives A and B): About 85 species of North American birds excavate nesting holes, use natural cavities resulting from decay, or use holes created by other species in dead or deteriorating trees. The absence of suitable nest sites is usually considered the limiting factor for cavity-nesting species (Thomas et al. 1979). The Partners in Flight Montana Bird Conservation Plan includes retention of all large snags and broken-top trees. Management for adequate numbers over the landscape is a critical objective to maintain viable populations of the Lewis's woodpecker and flammulated owl.

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red-breasted nuthatch, white-breasted nuthatch, hairy woodpecker, and western screech-owl.

Rationale 57 (alternatives A and B): One of the primary goals of gathering information about populations of birds that breed on the refuge is to determine how to best provide habitat for their life needs. The Service is the primary federal agency responsible for conserving, enhancing, and protecting migratory birds. By managing for and monitoring nongame migratory birds, the refuge can assist the Service in meeting the following goals of the National Wildlife Refuge System:

- Perpetuate migratory bird resources.
- Preserve natural diversity and abundance of fauna and flora on refuge lands.
- Provide refuge visitors with high quality, safe, wholesome, and enjoyable recreational experience oriented toward wildlife.

These objectives also help the refuge to meet its goal (as outlined in the EA and conceptual management plan) to “preserve a natural diversity and abundance of flora and fauna, with emphasis on Neotropical migrants.”

Partners in Flight uses a system that identifies species of conservation priority in each of its planning units, rather than writing planning information for all species. If conservation measures are focused on these species and their habitats, it is expected that other species in the area would benefit as well.

MPIF has identified a pool of species that represents priorities for conservation action within Montana. A species may be considered a priority for several different reasons, including global threats to the species, high concern for regional or local populations, or high state responsibility for conserving large or important populations of the species. MPIF also identified target habitats for conservation and study in the northern Rocky Mountains. The refuge contains three of these habitats—ponderosa pine forest, grassland, and marsh and wetland.

Relatively little is known about the abundance and population trends of most species of nocturnal owls in North America. Most species of owls are poorly monitored by existing NTMB surveys. In the last few decades, there has been increasing concern over the status of both diurnal and nocturnal raptors. Birds of prey are high on the food chain and are, therefore, highly susceptible to changes in the environment, which makes them good indicator species.

Broadcast surveys are one of the most widely used techniques to locate and survey owls. Broadcasting recordings of owl vocalization can increase calling rates. In September 1999, guidelines were developed for standardizing owl-monitoring surveys (“Guidelines for Nocturnal Owl Monitoring in North America,” Takats 2001).

Alternative B has an additional requirement that a bird species list would be developed to improve public use opportunities.

Rationale 58 (alternatives A, C, and D): Since Lost Trail is a relatively new refuge, documentation of avifauna is not well developed. Two point-count surveys were initiated in 2000. The first survey consists of 20 points along the South Pleasant Valley and county roads. This survey encompasses various habitats including grassland, wetland, and forest. The second survey is a walking survey along Pleasant Valley Creek. It starts in a forested riparian area on the north end of the refuge and ends in a grassland riparian area by the county road.

These surveys were developed to determine species presence and use, to develop a species list, and to monitor the effect that implementation of the habitat development plan and NRCS restoration projects would have on avifauna. Although point-count surveys would provide information on changes in species presence and general abundance, nest mapping or searching would better quantify the effects of restoration efforts.

The staff would work with the NRCS to develop intensive surveys along Pleasant Valley Creek, during and after restoration. NTMB surveys would be conducted in additional habitats such as forest, shrubland, and cottonwood and aspen woodlands. These additional surveys would more accurately portray species use and help staff determine how best to provide habitat for the life needs of these species.

Rationale 59 (alternative A): From a landscape perspective, the refuge is located in cattle country and healthy native prairie is disproportionately represented. Destruction and degradation of suitable habitat for NTMBs is a major factor in the decline of grassland bird species. Migratory birds would benefit from the restoration of grasslands to reflect natural conditions. Monitoring would be used to determine presence and absence of species, and production of indicator species, to assist managers in developing habitat management plans.

Rationale 60 (alternative C): The refuge's biologists would work with other public and private landowners in the Pleasant Valley area to preserve a diversity of habitats that would maintain a majority of the native bird species of the region.

OTHER WILDLIFE

LARGE MAMMALS

Rationale 61 (all alternatives): The refuge contains approximately 30 miles of interior fence, 10 miles of fence along the county road, and 20 miles of exterior fence. These fences were important for domestic herd

management prior to establishment of the refuge. However, they are not necessary for refuge management and can be harmful to wildlife. If fences become necessary on an interim basis, temporary fences (electric or barbless wire) can be constructed.

Wildlife can become entangled in fences, which can cause serious injury or death to an animal. At least five animals (four elk and one moose calf) have been found caught in fences on the refuge in the last few years. Fences can pose a hazard to ungulates by blocking escape routes, and allowing predators to more easily catch and kill animals. This is especially true of young animals that cannot follow adults over a fence. Young animals are also separated from their mothers by fences when the adult jumps the fence and the young cannot follow. The young, stranded animal often runs the fence line until the animal becomes caught in the fence or is killed by a predator.

The refuge receives up to 3 feet of snow in the winter. High snow levels may impede movement of ungulates through fences by blocking access under the fence. To alleviate this problem, all gates should be left open in the winter. Gates may also be added to remaining fences along the boundary and the county road.

Rationale 62 (all alternatives): As long as designated wildlife-viewing areas are not situated in critical survival areas for moose (e.g., calving grounds and winter feeding sites), high-quality photographic and observational opportunities can be provided (Youmans 1999).

Geist (1978) further defined effects of human disturbance in terms of increased metabolism, which could result in illness, decreased reproduction, and even death. Although winter is a time of lower metabolic rates and activity, ungulates normally lose weight. The degree of disturbance has mostly been reported in terms of flight distance or in some observed change in behavior manifested by animals.

Based on elk heart rate data, Chabot (1991) showed that even when disturbances do not induce an overt behavioral response, the increased heart rates could result in relatively high energy expenditures. Test results have been confirmed and expanded for a variety of ungulates including mule deer, white-tailed deer, and elk (Canfield et al. 1999). Responses of ungulates to human recreation during this critical period may range from apparent disinterest to flight, but every response has a cost in energy consumption. Although much research has been conducted on the effects of snowmobile disturbance on wintering ungulates, snowmobiles appear less distressing than cross-country skiers, hikers, and snowshoers (Freddy et al. 1986, Canfield et al. 1999).

The greatest disturbance for many ungulate species comes from unpredictable or erratic occurrences. In addition to increasing energy costs for wintering animals, recreational activity can result in

displacement to less desirable habitats, or in some situations, to tolerance of urban environments. Many ungulates enter early spring at the lowest physiological condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year.

Predators and prey interact with one another within their unique habitats, through seasonal weather patterns, and with other animal species and densities making it difficult to determine the direct relationship predators may have on prey. Identifying factors that drive changes in prey populations and predator-prey interactions is difficult. Many factors are involved, interacting with one another in a dynamic ecosystem, further complicating efforts to understand the affect of one single variable on a prey population.

Disturbance during the summer months may also have a negative impact on big game mammals as they seek optimum forage to provide energy for lactating females and antler growth in males. As summer progresses, impacts are expected to decrease as the snow melts and many animals head off the refuge to expanded summer ranges. Public use also disperses as logging roads and hiking trails open up on PCTC and public land surrounding the refuge.

Elk, white-tailed deer, mule deer, and moose are all herbivores. They forage to varying degrees on grasses, sedges, forbs, leaves, twigs, and stems of woody plants, masts, and fruits.

Rationale 63 (all alternatives): Chronic-wasting disease is a brain disorder that can cause death in deer and elk. It is highly contagious and can have serious impacts on populations. The refuge would be proactive in detecting chronic-wasting disease to prevent establishment of the disease, which could lead to a catastrophic loss of deer and elk. This adaptive approach provides a prescriptive process rather than crisis management.

Rationale 64 (all alternatives): The national scope and high profile of chronic-wasting disease, combined with Service responsibilities for wildlife resources that span state and federal jurisdiction, make it essential that the Service cooperate with other state and federal agencies in addressing this illness.

Chronic-wasting disease is a transmissible spongiform encephalopathy of deer and elk. Although the exact causative agent is unknown, the disease is related to infectious proteins that are resistant to normal metabolic breakdown processes and abnormally accumulates in the brain and brain stem. Consequentially, neurons die, which results in clinical signs referable to brain impairment. Eventually, diminishment of body condition and death occur.

There has been an increased distribution of chronic-wasting disease within and among states, and combined with high prevalence reported in some states has resulted in national and international attention to this disease. Therefore, it is the policy of the refuge to implement cooperation and coordination with other state and federal agencies in monitoring and managing this disease.

Rationale 65 (alternatives A, B, and C): The refuge is important winter habitat for a herd of approximately 300 elk. Moose and deer are primarily spring, summer, and fall residents. Although it would be difficult to manage for specific population numbers due to the wide range of these species across the boundaries of the refuge, the Service wants to ensure that their management decisions (i.e., hunting, public access, and vegetation manipulation) are not detrimental to large mammal populations, neighboring landowners, and habitat. Fluctuations in population sizes are natural and may occur for many reasons. If a decrease below 75 percent of current herd sizes occurs, managers must determine the cause of the change and if modifications in management are warranted.

Prior to establishment of Lost Trail as a national wildlife refuge, the land had been in private ownership. Opening the area to the public and public uses such as hunting and wildlife viewing may affect large mammal populations directly through hunting and indirectly through disturbance that may cause stress to the animals or changes in behavior. Disturbance can force animals off highly nutritious summer and fall range and onto less productive range. This may result in poorer body condition going into winter, which has been linked to lower reproductive performance and even death. Early fall movements may also leave nutritious summer forage uneaten at the cost of overgrazing winter range.

An example of this change in behavior was observed in Colorado. In the White River elk herd, an increase in early season hunting by bow hunters caused elk to move off their summer ranges before fall migration. The elk moved onto private land and secure areas. This led to complaints from local landowners of crop damage, complaints from resource managers that riparian areas were being damaged by this redistribution, and complaints by early season hunters of lower success rates in the public hunt areas (Conner et al. 2001).

Since the refuge has only recently been open to public hunting, it is still difficult to know if implementing the public use program may lead to elk movement and redistribution with corresponding overpopulation problems in localized areas including private lands. To increase landowner tolerance for big game animals and to minimize big game damage, it is advantageous for land managers to work with wildlife managers to reduce displacement of animals from public to private lands.

Rationale 66 (alternatives A, B, and C): Since Lost Trail is a relatively new refuge, management practices may result in large mammal populations increasing beyond carrying capacity, or may cause animals to concentrate in areas of high use, resulting in vegetation damage. Harassment by hunters and other public users may reduce use of select areas causing overutilization of areas with fewer disturbances.

Large mammal populations move freely across the boundaries of the refuge. It would be difficult to manage for a specific number of individuals given the size of their range and seasonality of use of the refuge. Staff can manage habitat and public use to affect population numbers and distribution of wildlife.

Managers must also coordinate with MFWP to evaluate how wildlife responses to practices on the refuge are affecting wildlife on an ecosystem level. In addition, evaluation would determine if effects observed on the refuge are a function of factors beyond the refuge. Vegetation and population dynamics would be evaluated to make and modify management decisions.

Rationale 67 (alternatives A and C): Until staff has time to determine big game use of habitats and movements of big game between habitats, recreational impacts on ungulates cannot be determined. Approximately 300 elk winter on the refuge. Winter is a critical time for ungulate survival. Animals that may have occupied thousands of acres of summer and fall range can be seasonally confined to relatively restricted geographic areas on which forage is limited and extreme environmental conditions can cause physiological stress. Almost 40 percent more food is required in winter to generate energy for daily metabolic and activity requirements.

Mackie et al. (1998) observed that, “Deer survive primarily by supplementing energy resources accumulated prior to winter with energy intake from submaintenance winter diets.” This requires behavior that emphasizes energy conservation. Inactivity provides an energetic advantage for animals exposed to cold; forced activity caused by human disturbance exacts an energetic disadvantage.

Many ungulates enter early spring at the lowest physiological condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year. The development of green vegetation at lower elevations on southerly slopes is also attractive for people following a long winter. Managers can provide an important contribution to energy conservation by reducing or eliminating disturbance of wintering ungulates and restricting recreational use of spring ranges that are important for assuring recovery from winter weight loss.

Rationale 68 (alternative B): Winter and spring are critical times for large mammals. Alternative B would allow winter recreation to a greater degree than in the other alternatives. An interpretive panel would educate visitors on the importance of minimizing disturbance to animals at this critical time of year.

Rationale 69 (alternative D): MFWP uses aerial surveys, ground surveys, and harvest data to monitor population trends and composition of elk, mule deer, white-tailed deer, moose, black bear, and mountain lion populations in northwestern Montana. The information gathered from these surveys is used by MFWP to determine the population health of individual species, project population estimates, and set hunting seasons. Hunting is the primary tool used by MFWP to manage ungulate populations (Canfield et al. 1999).

Only the data from the aerial elk survey can be separated out to be specific for the refuge. The other surveys show trends on a regional or area-wide scale. These surveys are still valuable, as the refuge is only a small part of the local ecosystem on which these species depend. Anything that affects populations outside the refuge would project onto those individuals using the refuge. Staff do not conduct formal refuge-wide surveys; however, they do record general observations that are valuable in monitoring herd health (i.e., wintering elk numbers and individual moose numbers).

Prior to establishment as a national wildlife refuge, Lost Trail had always been in private ownership. Although ranch owners and invited guests hunted the area, public hunting was not permitted. Opening the refuge to hunting and other public uses may negatively affect large mammal populations on the refuge and in the Pleasant Valley ecosystem. Monitoring would help managers assess the impacts of public use and other management decisions.

SMALL MAMMALS

Rationale 70 (all alternatives): Small mammal populations are a significant but often overlooked component of ecological communities. Any change in the density or diversity of small mammals can have significant impact and greatly affect the nature of the community. Changes in community structures commonly have ramifications far beyond the initial, small mammal species and may start an ecological chain of events resulting in much broader ecological consequences (Hickman et al. 1999). Despite this, small mammals have been little studied as to the effect that habitat changes and recreation may have on their populations.

Rationale 71 (alternative A): Columbian ground squirrels can cause extensive habitat damage and compete with other wildlife for forage and their diggings may accelerate soil erosion. Lambeth et al.

(1982) found that, up to a point, ground squirrel populations increased with plant retrogression. Other research has indicated that ground squirrels may move out of stands of heavy vegetation to more open, grass habitat.

Proposed habitat management should keep ground squirrel numbers in check by improving the health and density of native vegetation. Management towards a diverse predator base should also keep ground squirrel numbers in check. Ground squirrel populations would be monitored and adaptive resource management would only be used to reduce populations if a predetermined threshold of affected habitat is crossed.

Ground squirrels are an important source of protein for most predators in northwest Montana including birds of prey, weasels, canines, felines, and bears. The refuge is challenged with managing for predator species along with other native species. Although predators are of secondary importance behind native birds for management, they are critical to maintaining ecosystem health and are popular with public users. A substantial reduction in ground squirrel numbers would adversely affect those species that prey upon them. Ground-nesting birds may also be negatively affected as predators switch to alternate prey sources. Therefore, the refuge would maintain ground squirrel numbers within 20 percent of a baseline determined after initial monitoring and literature research.

RESIDENT BIRDS

Rationale 72 (all alternatives): Anecdotal information on golden eagles suggests that cumulative impacts on birds of prey from increased recreational activities may result in reduced nest success or nest abandonment (Canfield et al. 1999). A GIS-assisted viewshed approach, combined with a designated buffer zone distance, was found to be an effective tool for reducing disturbance to golden eagles in Colorado (Clark et al. 1989).

Rationale 73 (alternatives A, B, and C): Two NTMB survey routes have been run annually since 2000. The first of these routes follows the Pleasant Valley and South Pleasant Valley roads. The other is located on Pleasant Valley Creek, running from its inception onto the refuge to the Pleasant Valley Road. Neither one of these surveys adequately covers the upland habitats on the refuge. Migratory bird surveys are conducted in daylight hours using bird songs as the primary method of detection. Some resident species may not be detected using this method. Examples include species such as owls that are vocal predominantly in the evening, woodpecker-drumming patterns that are hard to distinguish between species, and marsh birds that are difficult to detect using traditional NTMB surveys.

The MPIF Plan (Casey 2000) and the Service's office of migratory bird management (USFWS 1995b) have prepared lists of bird species of concern. Several of these species can occur in habitats that exist on the refuge. The refuge may be able to contribute to these species' conservation simply by considering potential impacts from management activities prior to their implementation.

Rationale 74 (alternatives A, C, and D): The golden eagle is protected under the Bald Eagle Protection Act of 1940, as amended in 1962 (P.L. 87-844). Montana's population of golden eagles may be currently declining due to low productivity (Canfield et al. 1999). The Montana Bald Eagle Management Plan suggests a 0.5-mile radius buffer zone around bald eagle nests; therefore, the same criteria would be used for golden eagles.

Rationale 75 (alternatives A, C, and D): Habitat objectives would indirectly benefit upland games species.

Rationale 76 (alternative B): Grouse are endemic to the refuge and provide public use opportunities. They are a native component of the Pleasant Valley ecosystem. They are not, however, a priority species for which the refuge was established. Data from MFWP's region 1 suggests that grouse populations are stable region-wide and almost 50 percent of Montana's mountain grouse harvest comes from this region, which includes the refuge. For these reasons, the refuge proposes to foster mountain grouse populations, but not as a priority species. Populations would be monitored and habitat for grouse would be maintained.

Wild turkey is an introduced species and the refuge would not make management decisions based on turkey populations unless they become a nuisance species.

Rationale 77 (alternative C): There are some resident species—listed as a priority for conservation by the MPIF Plan (Casey 2000)—that the refuge could benefit. These include flammulated owls, black-backed woodpeckers, and brown creepers, for which the refuge could provide their habitat requirements. The refuge may be able to contribute to these species' conservation simply by considering potential impacts from management activities prior to their implementation. In addition, activities such as fire plans could be designed with these species' habitat requirements in mind.

AMPHIBIANS AND REPTILES

Rationale 78 (all alternatives): Reptiles and amphibians are important components of the biological integrity and functioning of an ecosystem. There are known and suspected declines of amphibians throughout North America, with a significant proportion of amphibians native to western United States (Corn 2000). Hossack (2003)

explains, “In response to documented and suspected declines in the United States, a national effort identified as the “Amphibian Research and Monitoring Initiative” was launched in 2000 to determine the status and trends of amphibian populations on Department of Interior lands nationally and to provide information useful in determining causes of declines.”

Rationale 79 (all alternatives): Survey data would be used to develop habitat guidelines and best management practices to protect and enhance these species. Reptiles and amphibians vary greatly in life history patterns. A single species may require a diversity of habitats. Aquatic areas with specific microhabitats and water temperatures are required for egg development, larval growth, and metamorphosis. Adults require different foraging and overwintering habitats—some aquatic, some terrestrial.

The diversity of needs, combined with the variety of unique habitats and microhabitats required to complete a life cycle, makes the impacts of recreation, water manipulation, and habitat alteration on herpetofauna difficult to study.

Amphibians and some reptiles require terrestrial and aquatic habitat to complete their life cycles. Adults generally live on land and lay their eggs in water. When the eggs hatch, they remain in aquatic environment as they metamorphose from tadpole to adult. Water temperature is critical to egg development and survival with each species having a maximum and minimum temperature at which it can survive.

Reptiles and amphibians select habitats with diverse physical characteristics including: (1) adequate sun exposure and water temperature; (2) substrates that are adequate for nesting and basking; (3) habitats that support insects and vegetation necessary for foraging; (4) aquatic habitats with mud bottoms for protection and deep waters that are unlikely to freeze; and (5) terrestrial habitats with animal burrows or deep litter for overwintering.

Many species are philopatric, choosing the same breeding, foraging, wintering, and migrating habitat year to year.

Rationale 80 (alternatives A, B, and D): To determine the cause of amphibian and reptile declines as well as the scope of a decline, a baseline for comparison must be determined.

Rationale 81 (alternatives A and C): Bullfrogs are not native to Montana. However, they have been widely introduced across the United States and now exist along the Bitterroot, Flathead, and Clark Fork rivers. Bullfrogs can affect amphibian and reptile populations directly through predation and indirectly through the avoidance of sites where bullfrogs are present. Bullfrogs have been implicated in the declines of several amphibian and reptile species.

Rationale 82 (alternative C): To determine the cause of amphibian and reptile declines we must first determine the scope of the decline on a regional or national level.

SPECIES OF CONCERN

Rationale 83 (all alternatives): The Service is required to carry out conservation programs for listed species and to ensure that agency actions are not likely to jeopardize the continued existence of listed species or adversely modify or destroy their critical habitat.

One of the primary purposes for the establishment of the refuge was to enhance the survival prospects of endangered and threatened species. Listed species that occur on the refuge include bald eagle, gray wolf, and Spalding’s catchfly. Species found in the forests surrounding the refuge and that probably use the refuge include the grizzly bear and Canada lynx. Bull trout do not exist on the refuge, but may be affected by management decisions.

Since the enabling legislation includes endangered and threatened species as a purpose for establishment of the refuge—and since the protection of endangered and threatened species in an inherently federal function with primary oversight by the Service—this plan has placed emphasis on these species.

The impacts on these species were considered in the development of objectives in the other sections such as habitat and public use. Managers must evaluate all actions prior to implementation to ensure that the action would not have a negative impact on endangered and threatened species.

Voluntary habitat conservation efforts, such as land or vegetation management plans and conservation easements would ultimately benefit many wildlife species (Sime 2002).

Private lands, in particular, have substantial value to wildlife because they frequently occur at low elevations with moderately extreme weather conditions such as deep snow.

Rationale 84 (alternatives A, C, and D): Lost Trail is a newly acquired refuge without a comprehensive list of plant and animal species.

Rationale 85 (alternative A): Since Lost Trail is such a new refuge, not all species using the refuge have been documented. Refuge staff must determine if a species currently exists on the refuge and then the biological potential for recovery or enhancement for the species must be evaluated.

Rationale 86 (alternative C): The Service is mandated to preserve and protect endangered species and to ensure conservation measures are available to

prevent species of concern from becoming threatened or endangered. The refuge would protect all threatened, endangered, or species of concern on the refuge and would evaluate the feasibility of restoring historical threatened and endangered species, or species of concern.

The refuge would develop an outreach program to raise public awareness of those species located in the Pleasant Valley area. As the public becomes more aware of threatened, endangered, and species of concern in their area, they would be more likely to notice and document the occurrence of these species. As they develop an understanding of the life history of these species, their importance in the ecosystem, and the reasoning behind management decisions, they would be more likely to accept restoration and protection efforts.

GRIZZLY BEAR

Rationale 87 (all alternatives): The refuge is located in an area classified as a management situation II under the Interagency Grizzly Bear Guidelines (USDA Forest Service 1986). Although grizzly bears occasionally inhabit the area, lack of highly suitable habitat and security precludes extensive use. The grizzly bear is important, but not the primary use of the area, and the refuge would not be managed exclusively for the grizzly bear at the expense of other priority species. However, the Service is required to carry out conservation (recovery) programs for listed species and to ensure that agency actions are not likely to jeopardize the continued existence of listed species, or adversely modify or destroy their critical habitat.

The refuge is located in an important linkage corridor for grizzly bears between the NCDE and CYE. Thus, it is important to maintain habitat and security for the grizzly bear.

Livestock grazing can have a significant impact on grizzly bears. In the NCDE, livestock depredation was the most common offense for which a bear was relocated (Thier and Sizemore 1981). Furthermore, these relocations were much less successful than relocations for other offenses (success being no return and no further conflict).

Knight et al. (1985) reported that depredations (livestock and property) were the leading cause of nonhunting mortality in the NCDE from 1975 to 1984. Unreported grizzly bear mortality related to livestock operations may be a significant part of the overall mortality. Jorgensen (1979) reported that only 41 and 17 percent of known bear kills in 1976 and 1977, respectively, were ever reported.

Several studies have addressed the question of whether grizzly bears can coexist with livestock without depredation. Knight and Judd (1983) reported that all radio-tracked bears (except one orphaned cub) that encountered sheep killed them.

However, Claar et al. (1999) found that only 2 out of 20 marked grizzly bears in the Mission Mountains (in the NCDE) were involved in sheep depredations, although almost all were in proximity to livestock during spring and fall. Several investigations observed that depredation behavior was apparently a learned process (Johnson and Griffel 1982, Jorgensen 1983, Knight and Judd 1983). Regional difference in depredation may be related to learned behavior and previous levels of control on depredating bears (Johnson and Griffel 1982).

Livestock can also affect grizzly bears through direct competition for early spring browse and by degradation of quality habitat by trampling and grazing. Finally, livestock grazing can affect bears by displacing them off quality habitat as they avoid areas of human activity.

To decrease the likelihood of depredation and the chance of individual grizzly bears becoming habituated to livestock as a food source, livestock grazing would not be permitted on the refuge if a bear were located within 1 mile of the refuge. Livestock grazing would also be restricted to prevent competition for spring forage.

Recreational activities can affect, directly or indirectly, the survival of grizzly bears. Grizzly bears can be directly taken in the defense of human life and through mistaken identity during black bear hunting seasons. In the Swan Range in northwestern Montana, out of 19 known human caused grizzly bear deaths, mistaken identity was the cause of 6 deaths and self defense was the cause 3 deaths.

Indirectly, recreationists can displace bears off quality habitat onto less desirable habitat. This may result in reduced reproduction by displaced bears, higher mortality rates due to food stress or lower security, and smaller bear populations due to reduced carrying capacity of remaining habitat (Serveen et al. 2001).

Conversely, grizzlies may become habituated to humans. Habituation generally leads to mortality of the bears as the bears are more likely to come in conflict with humans, are more vulnerable to hunters and poachers, and have an increased chance of becoming involved in a collision with a motor vehicle (Claar et al. 1999). Black bear hunting would not be permitted and other recreational activities may be suspended when a grizzly bear is known to be within 1 mile of the refuge.

Ground squirrel hunting is not permitted. Several studies have shown that ground squirrels may be important as a source of protein to grizzly bears and that the restricted availability of animal protein may limit grizzly populations (Nagy et al. 1983, Hechtel 1985, Hamer et al. 1978, Stelmock 1981).

The greatest impact of roads on grizzly bears is an increase in human access into grizzly habitat. Bears react differently to roads depending on habituation and security cover. Roads bring people into contact with bears, may cause bears to avoid habitats, or may habituate bears to humans. The refuge would not permit public use on any additional roads and would curtail administrative activities if grizzly bears were within 1 mile of the refuge.

Timber management and habitat manipulation can also affect grizzly bear use and should be evaluated prior to implementation.

Rationale 88 (all alternatives): Grizzly bears are not only a source of wonderment to wildlife enthusiasts, but also a source of fear and concern for some of the landowners whose lands border or are near the refuge, specially to those persons whose livelihood is intrinsically tied to domestic cattle and sheep ranching. It is known that these carnivores are opportunistic and kill available animals as prey to survive and feed themselves and their young. Cattle and sheep have been killed by these carnivores in areas where all of these species coexist, such as in western Montana.

The Service is working with the state of Montana and with private citizens and private conservation groups to conserve these species and to minimize conflicts with private landowners. The conservation group, Defenders of Wildlife, has established a successful compensation program to indemnify cattle or sheep ranchers that suffer losses from wolf depredations of their stock. The Service is confident that this group would continue with their program.

Interagency grizzly bear biologists believe that:

“Gaining support and confidence of people who live in or near grizzly habitat is one of the greatest challenges to grizzly bear recovery. Efforts that address the attitudes and concerns of the local public serve to foster tolerance and positive attitudes toward grizzly bears in communities throughout grizzly bear habitat. These efforts include intensive education programs, proactive livestock and garbage management projects that reduce bear attractants, and the maintenance of personal contact between citizens and wildlife biologists.” (LeFranc et al. 1987).

Opening the refuge to hunting may affect grizzly bears by increasing the chances of human–bear contact and conflict. Grizzly bears have also been killed by hunters who encounter them unexpectedly. Prior to 1999, 3 bears killed in the Swan Range in Montana and 14 bears from the NCDE had been killed by hunters who felt threatened by the bears (Claar et al. 1999). Hunting may also impact grizzly bears by habituation of these species to kill sites and subsequently humans. Grizzly bears have been

documented at kill sites and may even attempt to steal hunter-killed carcasses.

Rationale 89 (alternatives A, B, and C): Gaining the support and confidence of people who live in or near grizzly habitat are one of the greatest challenges to grizzly bear recovery. Efforts that address the attitudes and concerns of the local public serve to foster tolerance and positive attitudes toward grizzly bears in communities throughout grizzly bear habitat. These efforts include intensive education programs, proactive livestock and garbage management projects that reduce bear attractants on private land, and the maintenance of personal contact between citizens and state and federal wildlife biologists who live and work together in local communities and rural areas near grizzly habitat.

Managing human-induced mortalities is a major factory in effecting the recovery of the grizzly bear. Therefore, it is crucial to the recovery effort that the public understand reasons for actions to generate tolerant or positive attitudes toward the bear.

Rationale 90 (alternatives A and C): Where grizzly bear habitat was once continuous in the Rocky Mountain ecosystem, habitat fragmentation from human settlement and development has created isolated populations of grizzly bears. When a species exists as geographically separate populations, some level of movement and gene flow between them decreases their probability of extinction (Soule 1987, Harrison 1994, Serveen 2001). It is important to the survival of the species that individual bears from one localized population come in contact with individuals from other populations to maintain genetic variation. The probability of successful movement between grizzly bear populations depends on what is happening in the intervening areas between them. Thus, the management of linkage zones to maintain and enhance movement opportunities is a critical part of the successful recovery of the grizzly bear (Serveen 2001).

The refuge is located between the NCDE and the CYE of grizzly bear recovery. Potential linkage areas across Highway 2 remain between the towns of Marion and Libby. Grizzly bear recovery biologists believe that securing the future of the grizzly bear is dependant upon maintaining opportunities for linkage of wildlife populations across areas of human development (Serveen et al. 2001).

Habitat fragmentation is usually accompanied by habitat loss, increased disturbance and increased human–wildlife conflicts. The primary causes of fragmentation in grizzly habitat are human activities such as road building and residential, recreational, and commercial development. Conservation easements maintain agricultural lands and prevent increased fragmentation. Conservation efforts have

been initiated in the area surrounding the refuge. The NRCS has purchased conservation easements from willing landowners in the Pleasant Valley area, and the largest private landowner in the area, PCTC, signed a conservation easement with MFWP on 142,000 acres in the Fisher and Thompson river drainages. The refuge should work with other conservation organizations as well as the NRCS and MFWP to continue and expand this effort to preserve open space and limit fragmentation of habitat.

Managing human-induced mortalities is a major factor in the recovery of the grizzly bear. Therefore, it is crucial to the recovery effort that the public understand reasons for actions in order to generate tolerant or positive attitudes toward the bear. The interagency grizzly bear coordination team has appointed an information and education subcommittee to develop education programs and disseminate information. Private conservation organizations interested in the recovery of grizzly bears also provide valuable assistance when they include appropriate information in their publications and news releases.

Rationale 91 (alternative A): Maintaining the linkage area between the NCDE and CYE is important to the continued survival of the species. The grizzly bear has an increased risk of extinction because the population consists of a limited number of individuals that live in several distinct populations geographically isolated from one another. Small populations are less able to absorb losses caused by random environmental, genetic, and demographic changes (Serveen et al. 2001).

Linkage zones are areas between separated populations that provide adequate habitat for low densities of individuals to exist and move between isolated populations. The resulting exchange of genetic material helps maintain demographic vigor and diversity, increasing the viability of individual populations. For the grizzly bear, preserving the linkage between populations is as critical to long-term conservation of the species as managing the individual populations.

Rationale 92 (alternative B): Public viewing would improve interest in and public acceptance of the grizzly bear. Wildlife observation and photography are priority wildlife-dependent public uses for the Refuge System.

GRAY WOLF

Rationale 93 (all alternatives): The Service is required to carry out conservation (recovery) programs for listed species and to ensure that agency actions are not likely to jeopardize the continued existence of listed species or adversely modify or destroy their critical habitat. Disturbance during denning, around rendezvous sites, and in

winter habitat has the potential to adversely affect the survival of wolves in the area.

The presence of livestock on the refuge at any time of the year that wolves are in the area may contribute to depredation or habituation of wolves to livestock as a food source. Wolf–livestock conflicts cause negative public perceptions of wolves decreasing the acceptance of wolves by the public. Public support, particularly from private landowners, is critical to the continued success of wolf reintroduction.

Endangered species cannot be harassed or dispatched on refuge lands. They can be controlled on surrounding federal, state, and private lands if the Service’s wolf recovery team has determined that a wolf has habituated to killing livestock and, therefore, meets the definition of a problem wolf.

Lost Trail is one of the first national wildlife refuges in the Intermountain region to support wolves. The policy concerning gray wolves on national wildlife refuges in the western Great Lakes states is that, “gray wolves will be monitored, and refuge habitat management actions will maintain the current prey base for them while they are listed as threatened and for a minimum of five years following any future delisting. Trapping or hunting by government trappers in response to depredation complaints will not be authorized on these refuges.” The refuge will follow the same policy until notified otherwise.

Rationale 94 (all alternatives): Gray wolves are not only a source of wonderment to wildlife enthusiasts, but also a source of fear and concern for some of the landowners whose lands border or are near the refuge, especially to those persons whose livelihood is intrinsically tied to domestic cattle and sheep ranching. It is known that these carnivores are opportunistic and kill available animals as prey to survive and feed themselves and their young. Cattle and sheep have been killed by these carnivores in areas where all of these species coexist, such as in western Montana.

The Service is working with the state of Montana and with private citizens and private conservation groups to conserve these species and to minimize conflicts with private landowners. The conservation group, Defenders of Wildlife, has established a successful compensation program to indemnify cattle or sheep ranchers that suffer losses from wolf depredations to their stock. The Service is confident that this group will continue with their program.

Opening the refuge to hunting may affect wolves by increasing the chances of human–wolf contact and conflict. Claar et al. (1999) stated, “Of all recreational activities in Montana, big game hunting probably has the greatest potential for detrimental impact to wolves.” Hunting may also impact wolves by habituation of these species to kill sites and

subsequently humans. Wolves have been documented at kill sites and may even attempt to steal hunter-killed carcasses.

Rationale 95 (alternatives A and B): The success of wolf recovery in Montana has as much to do with the relationship between wolves and people as it does with the ecology of the species (Sime 2002). Providing scientifically based, factual information would keep the public informed and would reduce misconceptions, rumors, and suspicions. Education and knowledge about the wolf would hopefully make the public more objective and less emotional about this species and its management.

Rationale 96 (alternatives A and B): Because wolves and other large carnivores have large home ranges, attention should be focused on the habitat values of both public and private lands. Private lands, in particular have substantial value to wildlife because they frequently occur at low elevations with moderate extreme weather conditions such as deep snow. Voluntary habitat conservation efforts, such as land or vegetation management plans and conservation easements would ultimately benefit many wildlife species. (Sime 2002).

Farming and ranching in Montana maintains open space. That open space is also habitat for a diversity of wildlife species. Maintaining the land base for agriculture and wildlife habitat is an increasing challenge, given broader trends in resource and agricultural economics, human population demographics, and development of the “New West” (Sime 2002).

Increasing settlement during the last century has significantly transformed the valley floors of northwest Montana. Large undeveloped tracts of agricultural lands and a complex of wildlands, wetlands, rivers, grassland, and forests are being converted to home sites such as “ranchettes” of 2–20 acres as the region’s natural amenities attract new residents, vacation homebuyers, and businesses. This development trend has increased considerably in the last 20 years.

Flathead is one of the fastest-growing counties in Montana. Lack of planning and effective zoning has led to a highly fragmented residential development pattern. In 1999, 46 percent of new residential development in Flathead County occurred in rural areas.

The refuge is surrounded by large intact landownership. PCTC is a major landowner in the Pleasant Valley area. The state of Montana recently negotiated a conservation easement on PCTC lands in the Fisher and Thompson river drainages in northwestern Montana. However, the PCTC is selling land surrounding Island Lake just west of the refuge. Much of the other private land in the valley is under the ownership of large family-owned ranches. Two of

the ranches neighboring the refuge have already placed NRCS WRP easements on portions of their properties.

Pleasant Valley is located in a prime subdivision area with abundant wildlife, many lakes, and beautiful scenery and it is within easy commuting distance of Kalispell.

Rationale 97 (alternative A): One of the major limiting factors to wolf survival is an adequate prey base. In alternative A, big game population numbers are increased by improving habitat. Since deer and elk inhabit PCTC, USDA Forest Service, and private lands off the refuge during much of the year, the refuge would work with other agencies to determine what is limiting ungulate populations in the area. The refuge would then strive to provide or improve specific habitats.

For example, the refuge is an important winter range for elk in the Pleasant Valley drainage (personal communication, MFWP biologists and on-site refuge manager). Upland habitat improvement and time-specific public use restrictions may improve elk survival, which would increase the natural prey base available to wolves in the area.

A demonstration of the importance of an abundant natural prey base to wolf survival can be found in the examination of wolf–prey relationships in northwest Montana. White-tailed deer populations started to increase in the 1970s and remained high until the winter of 1996–97. Wolf numbers and distribution also expanded during this period.

Record hunter harvest in the fall of 1996, followed by one of the most severe winters on record, significantly decreased ungulate populations. This was followed by a corresponding increase in wolf depredation on livestock and subsequent wolf control. Conflicts between wolves and livestock during 1997 represented nearly 50 percent of all confirmed livestock depredations and lethal wolf control in northwestern Montana since 1987 (Bangs et al. 1998). Maintaining an adequate prey base should facilitate wolf recovery while decreasing depredation and control. Providing and sustaining sufficient prey base requires that ungulates be carefully managed and their habitats protected.

Evaluation of wolf management in the northern Rocky Mountains has shown that successful wolf recovery does not depend upon land use restrictions on private land due to the wolves’ ability to thrive in a variety of land uses. There is little, if any, need for land use restrictions to protect wolves in most situations with the possible exception of temporary restrictions around active den sites on federal land. Additionally, the public is much more tolerant of wolf recolonization if the presence of wolves does not result in restrictive government regulations.

Hunting success and regulations are directly related to prey populations. One of the greatest concerns the public had with wolf reintroduction was the effect that wolves would have on deer, elk, and moose populations. The primary deterrent of the long-term status of gray wolf survival is human attitudes toward wolves (USFWS 2001). The hunting public has made substantial financial investments and sacrifices to restore ungulate populations to Montana (Sime 2002), and hunters can be a strong ally or opponent to wolf survival. Therefore, the refuge would best gain support for a healthy wolf population by maintaining ungulate populations and not restricting hunting unless in direct conflict with the survival of a wolf pack in the Pleasant Valley area.

Rationale 98 (alternative A): An experimental, radio-collar-triggered, light and siren device developed to keep wolves away from livestock was tested in the Bitterroot Valley of Montana in 1999. Tests were conducted in 2000 on three members of the Sheep Mountain pack that were killing cattle in the Paradise Valley of Montana. The wolves were captured and fitted with electronic training collars and released into a 1-acre pen. A calf fitted with a remote training system was placed in the pen with the wolves. The wolves were shocked if they came within 1 yard of the calf. Initial results were good, but the project is still in the research and development stages. More research on this and other aversive methods are planned in cooperation with USDA Animal and Plant Health Inspection Service (APHIS), Wildlife Services; the University of Montana; and the Turner Endangered Species Fund.

Conducting control on problem wolves has led to local rural residents readily contacting the Service or APHIS if they suspect they have wolf-caused problems. Without control in place, there would most likely be more illegal killings than the average of one per year presently (USFWS 1999c).

Tolerance of wolves by the local public reduces illegal killing of wolves and allows more opportunity for the public and the Service to investigate innovative ways to reduce wolf–livestock conflicts without killing wolves (such as aversive conditioning). In addition, it enhances communication between resource agencies and people who live near wolves leading to more accurate data gathering on wolf restoration efforts. All this ultimately increases the likelihood of successful wolf recovery in the region.

Rationale 99 (alternative B): Alternative B focuses on maximizing the chances of wolf observation without substantially limiting other public uses.

Rationale 100 (alternative B): In the maximum public use alternative, the refuge would strive to provide viewing and photographic opportunities with minimal

disturbance to wolves. Wildlife observation and photography are two of the six priority wildlife-dependant public uses on refuges.

Rationale 101 (alternative C): One of the major limiting factors to wolf survival is an adequate prey base. In this objective, big game population numbers are increased by improving habitat. Since deer and elk inhabit PCTC, USDA Forest Service, and private lands off the refuge during much of the year, the refuge would work with other agencies to determine what is limiting ungulate populations in the area. The refuge would then strive to provide or improve specific habitats.

For example, the refuge is an important winter range for elk in the Pleasant Valley drainage (MFWP biologists and on-site refuge manager, personal communication). Upland habitat improvement and time-specific public use restrictions may improve elk survival, which would increase the natural prey base available to wolves in the area.

A demonstration of the importance of an abundant natural prey base to wolf survival can be found in the examination of wolf–prey relationships in northwest Montana. White-tailed deer populations started to increase in the 1970s and remained high until the winter of 1996–97. Wolf numbers and distribution also expanded during this period. Record hunter harvest in the fall of 1996, followed by one of the most severe winters on record significantly decreased ungulate populations. This was followed by a corresponding increase in wolf depredation on livestock and subsequent wolf control. Conflicts between wolves and livestock during 1997 represented nearly 50 percent of all confirmed livestock depredations and lethal wolf control in northwestern Montana since 1987 (Bangs et al. 1998). Maintaining an adequate prey base should facilitate wolf recovery while decreasing depredation and control. Providing and sustaining sufficient prey base requires that ungulates be carefully managed and their habitats protected.

Evaluation of wolf management in the northern Rocky Mountains has shown that successful wolf recovery does not depend on land use restrictions on private land due to the wolves' ability to thrive in a variety of land uses. Wolves have attempted to colonize the Pleasant Valley area two times in the last decade. In both instances, the wolves started to prey on livestock and were dispatched. Removing livestock, providing abundant natural prey, and protecting wolves from disturbance would create a more favorable habitat for the establishment of a free-ranging nondepredating wolf pack.

Hunting success and regulations are directly related to prey populations. One of the greatest concerns the public had with wolf reintroduction was the effect that wolves would have on deer, elk, and

moose populations. The primary deterrent of the long-term status of gray wolf survival is human attitudes toward wolves (USFWS 2000). The hunting public has made substantial financial investments and sacrifices to restore ungulate populations to Montana (Sime 2002), and hunters can be a strong ally or opponent to wolf survival. Therefore, the refuge would best gain support for a healthy wolf population by maintaining ungulate populations and not restricting hunting unless in direct conflict with the survival of a wolf pack in the Pleasant Valley area.

Rationale 102 (alternative C): Because wolves and other large carnivores have large home ranges, attention should be focused on the habitat values of both public and private lands. Private lands, in particular have substantial value to wildlife because they frequently occur at low elevations with moderately extreme weather conditions such as deep snow. Voluntary habitat conservation efforts, such as land or vegetation management plans and conservation easements would ultimately benefit many wildlife species. (Sime 2002).

Farming and ranching in Montana maintains open space. That open space is also habitat for a diversity of wildlife species. Maintaining the land base for agriculture and wildlife habitat is an increasing challenge, given broader trends in resource and agricultural economics, human population demographics, and development of the “New West” (Sime 2002).

Increasing settlement during the last century has significantly transformed the valley floors of northwest Montana. Large undeveloped tracts of agricultural lands and a complex of wildlands, wetlands, rivers, grassland, and forests are being converted to home sites such as “ranchettes” of 2–20 acres as the region’s natural amenities attract new residents, vacation homebuyers and businesses. This development trend has increased considerably in the last 20 years.

Flathead is one of the fastest-growing counties in Montana. Lack of planning and effective zoning has led to a highly fragmented residential development pattern. In 1999, 46 percent of new residential development in Flathead County occurred in rural areas.

The refuge is surrounded by large intact landownership. PCTC is a major landowner in the Pleasant Valley area. The state of Montana recently negotiated a conservation easement on PCTC lands in the Fisher and Thompson river drainages in northwestern Montana. However, PCTC is currently selling land surrounding Island Lake just west of the refuge. Much of the other private land in the valley is under the ownership of large family-owned ranches. Two of the ranches neighboring the

refuge have already placed NRCS WRP easements on portions of their properties.

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CANADA LYNX

Rationale 103 (alternatives A, B, and D): Although the Canada lynx would be considered in management decisions, the refuge contains only marginal habitat for lynx and even intensive management for lynx habitat on the refuge may not result in lynx using the refuge. Therefore, when conflicts arise, the needs of the lynx may not be the primary consideration in habitat management. However, Section 7 of the ESA (50 CFR 402) requires that federal agencies refrain from taking any action that destroys or adversely modifies critical habitat. While a critical habitat designation is warranted, critical habitat has not been designated for the lynx. Thus, the refuge should evaluate all management decisions in forest stands above 3,280 feet to ensure that lynx habitat is not adversely modified.

Lynx habitat in the Rocky Mountains consists of two structurally different forest types. Lynx require early successional forests that support high densities of snowshoe hare and late-successional forests that contain cover for kittens and for denning.

Timber harvest and related activities in forests have the greatest potential to affect lynx habitat. Timber harvest and associated forest management can be benign, beneficial, or detrimental to lynx depending on harvest methods, spatial and temporal specifications, and the vegetation potential of the site. Timber harvest can result in reduced cover, unusable forest openings, and large monotypic stands with sparse understories that are unfavorable for lynx and snowshoe hare.

Precommercial thinning also reduces snowshoe hare habitat by reducing cover. Forestry practices can benefit lynx when they result in understory stem densities and structure that meets forage and cover needs of snowshoe hare. Snowshoe hare densities are highest in regenerating stands with very high stem densities. Regeneration harvest can be used to create quality snowshoe hare habitat, especially where natural regeneration would be expected to provide dense, young vegetation (Hodges 1999a, 1999b; Ruggiero et al. 1999).

Although disease and insect attacks may increase fuel loads and the risk of large, high-intensity fires, they also provide dead and downed trees used for denning and cover. Thus, the role that disease and insects play in the dynamics of forest being manipulated must be carefully considered when managing stands for timber and lynx.

Rationale 104 (alternatives A and C): Although lynx trapping is currently prohibited in Montana, lynx can be trapped in other predator sets. It is not always possible to release a nontarget species from a trap unharmed. Human-caused mortality is believed to be additive in low-density lynx populations characteristic of the southern boreal forests (Koehler 1990). Therefore, illegal or incidental harvest can significantly reduce population numbers of lynx in southern regions.

Rationale 105 (alternative A): Late-successional mature forests that contain large, woody debris such as fallen trees or upturned stumps are required habitat for lynx denning (Berrie 1973, Koehler 1990, Koehler and Brittel 1990, Kesterton 1988, Murie 1963). Small-sized parcels (2.5–5 acres) of late-successional forest appear to be adequate for den sites, but these parcels must be connected by corridors of cover to permit females to move kittens to alternate den sites providing suitable access to prey. Several areas of habitat suitable for denning are required to ensure that habitat remains in the event of an uncontrollable natural processes such as destruction of habitat due to wildland fire.

Early successional forests where snowshoe hare are plentiful are favored hunting habitats for lynx. Such forests result from fires (Bailey et al. 1986; Fox 1978; Keith and Surrendi 1971; Koehler 1990, 1991), timber harvest (Conroy et al. 1979; Koehler 1990, 1991; Litvaitis et al. 1985), or windthrow and disease (Koehler and Brittel 1990). Based on hare pellet counts in Washington, Koehler (1990) found that hares were more abundant in younger-aged stands of lodgepole pine than in any other forest type. Studies strongly indicate that conifer cover is critical for hares during the winter. Hares are more likely to use young stands with dense understory than uncut or even-aged stands with little understory (Monthey 1986; Thompson 1988; Koehler 1990).

Although early successional forests are common habitat on surrounding PCTC lands, these stands may not be managed to support the dense understory that is required for high snowshoe hare populations. For instance, precommercial thinning is detrimental to snowshoe hare habitat but is a common management tool on productive timberlands. Staff should consult with PCTC biologists to determine snowshoe hare habitat on surrounding lands and then determine what would be required on refuge lands to support lynx in the Pleasant Valley ecosystem.

Canada lynx are specialized predators adapted to northern latitude and high-elevation habitats with abundant winter snows. Snowshoe hare are the lynx's primary prey, comprising 35–97 percent of their diet (McCord and Cardoza 1982). Conclusions from the "Ecology and conservation of lynx in the United States" are that a snowshoe hare density

greater than 0.5 hares per hectare (0.2 hares per acre) is required for lynx (Ruggiero et al. 1999).

Rationale 106 (alternative C): Lynx habitat consists of a mosaic of forest habitats such as early successional forests that support high densities of snowshoe hare and late-successional forests that contain cover for kittens and for denning. Wildland fire, windthrow, and disease are all natural processes that create these forest conditions (Bailey et al. 1986, Fox 1978, Keith and Surrendi 1971, Koehler 1990, Koehler and Brittel 1990). Although disease and insect attacks may increase fuel loads and the risk of large, high-intensity fires, they also provide dead and downed trees used for denning and cover.

A fire plan should be developed to reduce the risk of a catastrophic natural wildland fire resulting from natural processes management on the forestlands while allowing benefits derived from natural fires.

BALD EAGLE

Rationale 107 (all alternatives): An occupied eagle nest site is any site with recorded activity of breeding within 5 years. One of the preferred planning options in the Montana Bald Eagle Management Plan (MBEWG 1994) is nest site management zones. These zones are concentric circles around each nest site in which different management options are applied. Zone I extends 0.25 mile from the nest site in a concentric circle and is defined as the "nest site area." In this area, human activity or development may cause the abandonment or lower the productivity of the breeding area.

Zone II extends from 0.25 to 0.5 miles from an occupied nest site. This area is defined as the "primary use area" and is where 75 percent of a breeding pair's activity (foraging, loafing, and bathing) occurs.

Bald eagles are sensitive to human disturbance, especially activity after nest initiation and prior to fledgling. This activity can result in decreased nestling survival (Steidl and Anthony 1996). Lost Trail is a national wildlife refuge and, as such, is held to higher standards where endangered species are concerned. Although the Montana Bald Eagle Management Plan guidelines permit minimal disturbance in zone II, the refuge would extend zone I guidelines to 0.5 mile.

In management zones I and II, habitat alteration (such as timber harvest, prescribed fire, power line construction, pesticide use, land clearing, levee or dam construction, and wetland drainage) that may negatively affect the breeding and foraging area of bald eagles should be evaluated prior to implementation.

Guidelines developed by the bald eagle recovery team (USFWS 1986) recommend a goal of at least one fledged per year on average per nesting pair and

an average nest-success rate of not less than 65 percent over a 5-year period.

Rationale 108 (all alternatives): Nest site monitoring is an important tool in determining population trends of many bird species. The bald eagle nest survey form is designed to standardize raptor nesting data collection and is valuable in tracking progress toward the delisting of the bald eagle. The Montana working group coordinates the annual survey, and compiles and evaluates the results. After hatching, eagles are less sensitive to disturbance and are less likely to abandon or neglect young.

Rationale 109 (alternatives A, B, and C): Eagles are attracted to carrion. If carrion exists along a road, eagles become vulnerable to oncoming traffic. This is especially true when the eagle is gorged and during the winter when ambient temperatures are below freezing and wind is calm (MBEWG 1994b).

Power lines and poles pose an electrocution and collision threat to eagles. Existing power lines can be modified to reduce the danger to eagles and other migratory birds. New power lines should be evaluated to minimize affects on eagles.

Eagles are vulnerable to leg-hold traps near site baits. They can be caught in these traps and sustain severe injury or death.

Rationale 110 (alternatives A and C): Zone III in the Montana Bald Eagle Management Plan guidelines represents most of the home range used by eagles during the nesting season. It usually includes all suitable foraging habitats within 2.5 miles of all nest sites in the breeding area that have been active within 5 years.

The management goal for Montana is to facilitate population growth until the number of breeding pairs peaks. After that, the management goal is to provide secure habitat to maintain a healthy self-sustaining population as close to peak levels as possible (MBEWG 1994b). Secure habitat includes all area within 0.5 mile of a nest and key use areas within 2.5 miles of a nest site. Disturbance and habitat modifications in zone III could lead to the disruption of nesting or a decrease in nestling survival.

Rationale 111 (alternative A): The Montana bald eagle working group (1991) characterized quality habitat as a mature forest stand of low to moderate canopy closure consisting of cottonwood, Douglas-fir, ponderosa pine, or mixed conifer. Forest stands with nest sites should be 20 acres or larger and be located within 1 mile of open water. The stand should contain at least two suitable nest trees (older, large-diameter trees) and more than three perch trees. Feeding habitat should be greater than 80 acres with shallows, grasslands, and meadows intermixed.

Rationale 112 (alternative B): Development of public use would be allowed within zone II if it were found to be compatible with continued eagle production. This would be measured by the production of on an average of one fledgling per year and a nest success rate of 65 percent, over a 5-year period.

Rationale 113 (alternative B): Productivity objectives in the Recovery Plan (USFWS 1986) are an average of 1.0 young produced per occupied breeding area with 65 percent success, over a 5-year period.

An interpretive display located within 0.5 mile of the eagle nest may affect production. For a blind to be effective, it must be located close to the nest or perch trees. Use must be strictly regulated and affects on eagles monitored. Recreational activities that enhance awareness and understanding, and foster support of management objectives for bald eagles should be encouraged as long as they do not jeopardize the continued recovery of the species.

Rationale 114 (alternative C): Foraging flights by resident breeding adults may extend beyond the 2.5-mile radius of zone III. Nonbreeding bald eagles are often excluded from the preferred foraging areas by resident nesting bald eagles and must use outlying habitat. Security from intrusion and disturbance and the maintenance of adequate prey is important to the survival and eventual delisting of the bald eagle.

Rationale 115 (alternative C): Recreational activities that enhance awareness and understanding of bald eagles, and recovery needs should be encouraged. This would minimize disturbance to and conflicts with bald eagles on and off refuge lands.

TRUMPETER SWAN

Rationale 116 (all alternatives): Trumpeter swans are occasionally observed on Island and Flathead lakes, and various other locations in northwestern Montana. The Flathead Valley is one of three areas where suitable habitat existed and trumpeter swans were once a common breeding species in the United States. (Banko 1960)

One of the greatest threats to trumpeter swan survival in the Rocky Mountain population is that the swans concentrate in local wintering areas where food resources are becoming scarce and where they are at a greater risk of disease outbreaks. Locations of swans in areas outside of the Yellowstone-Idaho area should be reported to the trumpeter swan working group, as these swans may be pioneers that could establish new breeding and wintering grounds.

Rationale 117 (all alternatives): Nesting trumpeter swans have been shown to be sensitive to human disturbance during the nesting season. Birdwatching, photography, research, and other activities in or near nesting areas may cause nest failure or cygnet loss by disturbing adults (Mitchell

1994). In Yellowstone National Park, human intrusion was the most significant known cause of egg failure in trumpeter nests (Banko 1960).

Rationale 118 (alternatives A and C): Trumpeter swans are long-lived, social birds that are highly dependent on strong family bonds and traditional patterns of habitat use that are passed down through generations (USFWS 1995a). When swans were eliminated from much of their range, they not only lost a major segment of the population but perhaps of greater importance, they lost flyway traditions.

Today, the majority of trumpeter swans in the Rocky Mountain population concentrate on a small number of wintering grounds. Severe losses could occur from disease outbreaks, severe winter weather, and lack of forage. In 1989, more than 100 swans died in the tri-state area when a blizzard swept through a major wintering area. Since then, winters have been mild, but the possibility of another hard winter always exists.

As the swan population increases, the limited resources in the area are taxed and may not recover to provide forage for the next year. It is important to the survival of the RMP to relearn and rebuild migratory patterns that were lost when swans were exterminated from much of their range. Historical accounts indicate that the Flathead Valley was once a major nesting area for swans. In recent times, there have been sporadic reports of swans wintering in northwestern Montana along the Flathead and Clark Fork river drainages.

Trumpeter swans have also been observed during migration and a pair was documented in the Pleasant Valley area one summer but breeding was not recorded. The ultimate goal is to reacquaint trumpeter swans with wintering grounds, breeding areas, and migratory routes that were lost when the population neared extinction in the early 1900s. This would be accomplished through natural pioneering and through transplant of swans to suitable habitat.

Important requirements for successful breeding of trumpeter swans include the following:

- room for take off (approximately 328 feet)
- accessible forage
- shallow, stable levels of unpolluted, fresh water
- emergent vegetation, muskrat island, or other structure for nest site
- low human disturbance
- highly irregular shorelines
- water depth of less than 3.9 feet
- abundant and diverse communities of aquatic plants
- abundant invertebrate populations

(Mitchell 1994, Hansen et al. 1971, Maj 1983, Squires 1991, Lockman et al. 1987)

Rationale 119 (alternative B): The introduction of trumpeter swans to Dahl Lake may have an impact on public uses such as hiking, bird watching, fishing, and hunting. In alternative B, the refuge would look at the impact on public use and survey the public to determine if restoration efforts should be pursued on Dahl Lake. Naturally occurring swans would still be protected by minimizing disturbance.

Rationale 120 (alternative C): Interpretation and environmental education are priority wildlife-dependent public uses. Information promoting an understanding of the species would make the public more aware of the needs of the swan and the importance in limiting disturbance. Interpretation and environmental education reach beyond the boundaries of the refuge and help protect the species on a far greater level.

BLACK TERN

Rationale 121 (all alternatives): Black terns have shown continent-wide population decline since 1960 and are listed as threatened or endangered in six states. They are listed as a species of concern in 18 other states and provinces (Casey 2000). Black terns are listed as a Service nongame bird of management concern (USFWS 1995b, 2002). In Montana, black tern is listed as a species of special concern with a ranking of vulnerable under the Natural Heritage Program classification system (Shuford 1999), but has not been consistently monitored.

Declines are probably related to a loss of wetlands and a decrease in food supply, in part, caused by insect control (Dunn and Agro 1995). Black tern populations are difficult to quantify on an ecosystem level because black terns exhibit low site fidelity. Loss of potential nesting and foraging habitat for black terns is greatest in northeastern and northwestern Montana.

To evaluate the status of black terns in Montana, individual agency records need to be compiled and evaluated. Tern production on the refuge was documented by MFWP in 1999. Terns were observed by refuge staff in 2000 and 2001. Restoration and enhancement of refuge wetlands may affect tern nesting.

Black terns nest in shallow, freshwater wetlands in emergent vegetation. They prefer wetland complexes greater than 20 hectares (49.4 acres), in areas with 25–75 percent of the surface covered with emergent vegetation, water depths between 0.5 and 1.2 meters (1.6 and 3.9 feet), and nesting substrate within 0.5 and 2 meters (1.6 and 6.6 feet) of open water (Dunn and Agro 1995). Nests are often lost to bad weather, effects of winds and waves, and changing water levels. Known predators include great horned owl, mink, northern harrier, ring-billed gull, American

crow, common raven, raccoon, muskrat, long-tailed weasel, otter, and snapping turtle (Gerson 1988, Novak 1992, Dunn and Agro 1995). Nest success would be monitored to document production.

Degradation of lake habitat may occur by succession, raising or lowering water levels, introducing exotic species, and reductions in water quality (Novak 1992). Nest platforms can be flooded out by rising water levels. Low water levels may increase likelihood of nest predation by mammals. Black terns may shift breeding sites from year to year in response to changes in hydrologic cycles and emergent vegetation (Shuford 1999). In most cases, WPA managers can provide suitable nesting habitat for black terns without any major changes to their water management (Casey 2000).

Rationale 122 (alternative B): Black terns may be a species of interest to the birding community. A bird list would give the public information on species that may be observed on the refuge, the habitat in which to look, and the season of the year they are most likely on the refuge. It would also raise the awareness of the species of special concern status and foster understanding and support for management efforts.

Rationale 123 (alternative B): Since these species are rare, therefore difficult to observe, the refuge may not be able to provide viewing. Information about the sensitivity of the species and how to protect them would be disseminated to the public and public use would be directed to areas and species that could handle limited disturbance. Educating the public on the conservation needs of these species would promote understanding and support for management programs.

BOREAL TOAD

Rationale 124 (all alternatives): Hossack et al. (2001, 2003) found evidence of boreal toads breeding on 5 of 20 sites surveyed in 2001 and 15 of 28 sites in 2002. Boreal toads were located at less than 5 percent of other forested sites surveyed in Montana since 1999.

Dahl Lake has the largest reproducing population known for the Rocky Mountains (based on the number of larvae observed). There is a concern that this species is declining in the region. Evidence from Glacier National Park and the refuge show that breeding sites are often clustered in a small area, hence are at risk to environmental changes for local extinction.

The development of water impoundments or any change in water manipulation or water levels can result in the loss of key breeding, overwintering, and foraging habitats for herpetofauna. Water impoundments that are developed for waterfowl production may lead to a decline in reptiles and amphibians through increased depredation from a high concentration of waterfowl.

A high concentration of waterfowl can also lead to a decrease in water quality. At Bosque del Apache National Wildlife Refuge in New Mexico, waterfowl increased nitrogen levels by 40 percent and phosphorus levels by 75 percent in the winter of 1995–96 (Post et al. 1998). Amphibians have highly permeable skin and egg membranes and complex life cycles.

Many species are philopatric to specific breeding, foraging, and overwintering habitats. With such an important locally breeding population and possibly an important regional breeding population, refuge management and wetland restoration projects should be carefully examined for the potential impacts to this species.

SPALDING'S CATCHFLY

Rationale 125 (all alternatives): Spalding's catchfly is a native forb of the carnation family (Caryophyllaceae) that occurs in mesic slopes, flats, or depressions of open grasslands. It is associated with Idaho fescue, rough fescue, and bluebunch wheatgrass. The catchfly is occasionally interspersed with conifers.

Twenty populations have been documented in northwestern Montana in the following counties: Flathead (6), Lake (2), Lincoln (6), and Sanders (6). A new population was discovered on the refuge in 2002. This population is one of the largest documented sites in Montana and contains a minimum of 300 plants within about 9.5 acres. Part of this population exists on Montana DNRC land within the legislative boundary of the refuge. The staff is certain more plants will be discovered as inventory efforts continue.

Federal law requires that endangered species be protected and, if possible, restored on federal lands. The refuge has up to 2,500 acres of Idaho fescue- and rough fescue-dominant habitat that could support Spalding's catchfly. Since there are only 53 known populations of Spalding's catchfly in fragmented populations across the northwest, the relatively large population located on the refuge and any new populations that may be discovered are significant to the plant's survival.

Threats to Spalding's catchfly include grazing and trampling by domestic livestock and native herbivores, herbicide treatment, competition from nonnative plants, and competition from pollinators. Prescribed fire may have a positive effect on Spalding's catchfly by removing litter or duff layers and woody plants, thus improving natural propagation of the plant. Recruitment of Spalding's catchfly was enhanced following prescribed fire in Montana (Lesica 1992, 1999). The effects of fire would vary, depending on fuel moisture, species composition, season, and intensity of burning (Lesica 1997). Prescribed fire may also increase invasive nonnative plant populations, which may negatively affect on Spalding's catchfly. Therefore, prescribed

fire may enhance Spalding's catchfly survival and recruitment but must be thoroughly evaluated prior to use.

Invasive plants displace the plant and compete with it for water, nutrients, light, and pollinators (Delphey and Rey-Zizgirdas 2001, Montana Natural Heritage Program 1998). Many locations of Spalding's catchfly are at risk of being displaced by nearby populations of invasive plants, especially spotted knapweed and sulfur cinquefoil. Herbicide use to control invasive plants may also harm the catchfly. An integrated pest management program should be evaluated including hand pulling, hand spraying, and biological control to reduce encroaching invasive plants while not harming the catchfly.

Management tools such as prescribed fire and invasive plant control would benefit the catchfly as long as careful attention is given to implementation. Management tools such as grazing, prescribed fire, and spraying may adversely affect Spalding's catchfly populations, even though they could also be critical to its continued existence. A burning program at the wrong time of year or in an area subject to more invasive plant encroachment could create a disadvantage for the catchfly.

Invasive plant control alone is important due to invasive plants displacing and in competition with the catchfly (Delphey and Rey-Zizgirdas 2001). However, herbicide application has to be carefully applied at the right time of year and not in the location of plants to not damage the catchfly. Federal law prohibits modification of critical habitat, and any act that may jeopardize the continued existence of a listed species. Prior to implementation of any management actions that may affect Spalding's catchfly, a survey must be conducted to determine if this species is in the management area. If the species were located, refuge staff would evaluate the effect that implementing the management action would have on the plant and develop the best management practice.

Although there is a federal responsibility to maintain this threatened plant population, its location on a national wildlife refuge provides unique possibilities for environmental education and interpretation. Careful planning could present opportunities in the future for guided tours to view the plant and learn about its habitat characteristics and threats to its continued existence. Visitors could help locate new populations while out hiking or hunting, if they are exposed to preliminary information in the visitor contact station.

CULTURAL RESOURCES

Rationale 126 (all alternatives): There are a number of laws that require or encourage active surveying for cultural and historical resources, to minimize

damage and deterioration to sites and to preserve them for future generations.

The Archeological and Historic Preservation Act (ARPA) authorizes federal agencies to use various means to obtain funding to identify and preserve data of cultural and historical items and sites.

The ARPA requires that federal managers develop plans and schedules to locate the most scientifically important archaeological sites.

Cooperation between the Montana State Historical Preservation Office, the THPO, and the Service would be needed to ensure that surveys of resources by the Service's region 6 archaeologist or its contractors are comprehensive.

Maintaining and protecting cultural and historical resources requires law enforcement staff with appropriate training.

The integrity of cultural resources located on Service lands is subject to threats from erosion, neglect, vandalism, grazing, cultivation, and other land-disturbing activities. The Service is required by statute to exercise caution in carrying out its activities to assure that historical properties are not inadvertently sold, demolished, substantially altered, or allowed to deteriorate significantly without adequate review and protection.

Many of the laws that regulate management of cultural resources on Refuge System lands are concerned with avoiding or mitigating impacts to these resources during the planning of and implementation of projects. There are stipulations to stop projects if objects or sites are uncovered during work. Even though the refuge works with partners with expertise in cultural and historic fields, staff involved with planning and implementing projects should have enough training to recognize potential sites to minimize damage to resources.

Refuge projects would need to include trained personnel (whether on staff, the Service's region 6 archaeologist, or its contractors) who would check sites prior to and during implementation so as not to damage cultural or historical resources. While this would add to costs, it is required by law. It would also provide documentation of any new sites and resources uncovered.

Rationale 127 (all alternatives): The preservation of historical heritage is in the public interest so that its vital legacy of cultural, educational, aesthetic, inspirational, economic, and energy benefits would be maintained and enriched for future generations of Americans.

Minimum staffing guidelines for the refuge call for law enforcement and public use personnel. If provided, these can be available to coordinate and conduct documentation, protection, and

interpretation of cultural resources. Basic facilities and support provided for other management programs (such as office space, computers, and vehicles) can also be used to support management of cultural and historical resources.

By actively seeking and documenting as many sites as possible at the refuge, managers can develop plans that would avoid as much damage as possible to the resources. This would also save time and money by eliminating or modifying projects that would have to be delayed, redesigned, or stopped if a cultural or historical site were uncovered during the undertaking.

Rationale 128 (alternatives A, B, and C): The ARPA requires land-managing agencies to establish public awareness programs regarding the value of archaeological resources to the Nation. However, refuge managers should understand that these sites are sensitive, and allowing uncontrolled access by the public to them is unacceptable.

Refuge managers must ensure the physical integrity of the sites, including maintaining appropriate location confidentiality. These resources are increasingly endangered because of their commercial attractiveness and education is a way to encourage compliance with rules and regulations and increase protection.

Rationale 129 (alternatives A, B, and C): It is the policy of the Service to identify, protect, and manage cultural resources located on Service lands and affected by Service undertakings, in a spirit of stewardship, for future generations. Specifically, the Service would manage these resources in such a manner that sites, buildings, structures, objects, and values of importance are sufficiently protected for present or future scientific study, public appreciation, and socio-cultural use.

The historical and cultural foundation of the Nation should be preserved as a living part of community life and development in order to give a sense of orientation to the American people and a spirit of stewardship for the inspiration and benefit of present and future generations. The preservation of this irreplaceable heritage is in the public interest so that its vital legacy of cultural, educational, aesthetic, inspirational, economic, and energy benefits would be maintained and enriched for future generations of Americans. There are a variety of laws in place that provide direction and legalities, including the Archaeological Resources Protection Act, the Archaeological and Historic Preservation Act, the Historic Sites, Buildings and Antiquities Act, and the National Historic Preservation Act.

Rationale 130 (alternative B): With the refuge still developing its infrastructure, historical structures could be used for administrative purposes. In

accordance with Executive Order No. 13006, federal agencies shall—prior to acquiring, constructing, or leasing buildings for purposes of carrying out agency responsibilities—use historical properties available.

PUBLIC USE

Rationale 131 (all alternatives): Careful planning provides the visiting public with opportunities to enjoy and appreciate fish, wildlife, plants, and other resources. As a result, the public would develop an understanding and would build an appreciation of each individual's role in the environment today and into the future.

Rationale 132 (alternatives A, B, and C): Wildlife-dependent recreational public use—hunting, fishing, wildlife photography and observation, interpretation, and environmental education—are great means of fostering understanding and instilling an appreciation of native fish, wildlife, and plants and their conservation. They are also part of the priority wildlife-dependent public uses designated in the National Wildlife Refuge System Improvement Act of 1997.

Because Lost Trail is a new refuge, there is limited background on what the public wants and expects from the refuge. It needs to be determined which opportunities can be offered that would provide quality experiences, that would be used by and attract visitors, and that would complement and enhance opportunities provided by the private sector or other agencies.

Rationale 133 (alternatives A and B): A day use area would support and encourage wildlife-dependent public uses by allowing visitors to stay longer and experience more of the refuge. The refuge is remote, with few nearby services and no nearby public eating or restroom facilities.

These basic facilities would allow visitors to stay longer and obtain a higher quality experience. This, in turn, would lead to more opportunities to appreciate and support fish, wildlife, plants, and their habitats; the refuge; and the Service. To provide for environmental education opportunities for school groups, the refuge would need to provide a place for students and educators to eat their lunch, along with drinkable water and restrooms facilities.

Rationale 134 (alternatives A and B): An environmental education campground area would allow for the practical and effective operation of the environmental education program by allowing students and educators to stay longer and experience more of the refuge. Environmental education is one of the priority wildlife-dependent public uses that refuges are encouraged to provide if compatible.

Environmental education is an excellent means to foster understanding and instill an appreciation of

native fish, wildlife, and plants, and their conservation in educators and youth. Because the refuge is so remote (1 hour from the nearest large population center of Kalispell, population 15,000), travel time to and from the refuge would reduce time spent on-site. Participants could receive a higher quality experience if they had the opportunity to spend more time in the field participating in hands-on activities. The campground may also facilitate the participation in environmental education by more-distant schools, especially those that cannot make it to the refuge within a school day.

Rationale 135 (alternative B): Wildlife-dependent recreational activities are allowed on refuges if they can be carried out without detrimentally affecting the purpose for which the refuge was established and goals of the National Wildlife Refuge System. The refuge was established primarily for migratory birds, but also to enhance the conservation of all wildlife species. The public use activities proposed in this CCP have been developed with minimal data on important areas of the refuge for wildlife. Once refuge staff has determined these areas, there may be opportunities to enhance public use without harming native plants, wildlife, and their habitats.

Rationale 136 (alternative B): The National Wildlife Refuge System Volunteer and Community Partnership Enhancement Act of 1998 (P.L. 105-242) strengthens the Refuge System's role in developing effective partnerships with various community groups. Volunteer and support groups fortify refuge staffs with their gifts of time, skills, and energy. These groups are integral to the future of the Refuge System. Refuge staff initiates and nurtures relationships with volunteers and support groups, and continually support, monitor, and evaluate these groups with the goal of fortifying important refuge activities.

Rationale 137 (alternative B): Wildlife observation, wildlife photography, and fishing are priority wildlife-dependent public uses. Access to the lake would support these uses and would provide for different quality experiences.

Rationale 138 (alternative C): The refuge is remote with no other nearby restroom facilities or drinkable water. Providing these basic facilities would allow visitors to stay longer and obtain a higher quality experience. This, in turn, would lead to more opportunities to appreciate and support fish, wildlife, plants, and their habitats; the refuge; and the Service.

Rationale 139 (alternative C): A campground area would allow for the practical and effective conduct of the environmental education program by allowing students and educators to more effectively participate in data gathering and restoration projects. Because the refuge is so remote (1 hour away from the nearest large population center of Kalispell,

population 15,000), travel time to and from the refuge would cut into time spent at the refuge. To make best use of students and educators in data-gathering and restoration projects, many of which are long-term, it would help to allow them to stay one or more nights at the refuge. Participants could receive a higher quality experience if they had the opportunity to spend more time in the field participating in hands-on activities.

Rationale 140 (alternative D): Some basic facilities are needed to support the wildlife-dependent public uses currently allowed (hunting, wildlife observation and photography, environmental education, and interpretation). The refuge is remote with few nearby services. Basic commodities such as restroom facilities and drinking water are needed to extend the use of the refuge and, subsequently, promote opportunities to foster appreciation and support of natural resources, the refuge, and the Service. Limitations in these facilities may curtail public use.

HUNTING

Rationale 141 (all alternatives): The Service recognizes hunting as a healthy, traditional outdoor pastime, deeply rooted in American heritage. When managed appropriately, hunting can instill a unique understanding and appreciation of wildlife, their behavior, and their habitat needs.

Local wildlife populations should be able to coexist with a hunt program. Elk populations within MFWP's hunting district 103 are consistently above MFWP objective levels. Refuge lands are primarily elk winter range. Removal of some elk within the refuge would facilitate adequate harvest levels and assist MFWP in optimum management of the local elk population.

White-tailed deer are year-round residents; mule deer primarily use the refuge in fall and winter. Their populations have been steadily increasing in the past 4 years. MFWP monitors both species to facilitate adaptive management using harvest regulations.

Hunting generally has no appreciable impact on healthy small game populations as the harvest is insignificant compared to natural mortality. Of the MFWP's seven regions, region 1 yields 50 percent of the statewide harvest of mountain grouse, indicating a consistently high population in the area of the refuge and the ability to tolerate hunting pressure.

Turkeys were released in the area by MFWP to increase hunting opportunities. They are not indigenous to Montana and so are not a priority species for refuge management.

Rationale 142 (all alternatives): The mission of the National Wildlife Refuge System is to conserve and protect wildlife, plants, and habitat. The Service desires a hunt that reflects positively on the refuge,

the Refuge System, and the Service. However, hunting at the refuge is a relatively new use and there is limited history of impacts of hunters. The refuge will take the opportunity to “set the standard” early on so hunters will know what to expect in the future.

Rationale 143 (all alternatives): Hunting is a legitimate and appropriate public use of the Refuge System. Hunting programs will promote understanding and appreciation of natural and cultural resources and their management on all lands included in the Refuge System. Monitoring programs must focus on the impacts of recreational activities on wildlife, habitat, and the quality of experience for the public.

A quality hunt is defined as one that: (1) maximizes safety for hunters and other visitors; (2) is available to a broad spectrum of the hunting public; (3) provides hunters uncrowded conditions by minimizing conflicts and competition among hunters; and (4) provides reasonable challenges and opportunities for taking targeted species under the described harvest objective established by the hunting program. It also minimizes the reliance on motorized vehicles and technology designed to increase the advantage of the hunter over wildlife. By implementing successful monitoring techniques, hunting can be evaluated and adaptively managed to meet established standards and ensure that activities continue to be appropriate and compatible.

There is a history of extensive hunting on neighboring lands (PCTC has a block management plan in place with MFWP and there are a few sections of DNRC lands within the acquisition boundary of the refuge). Allowing hunting on portions of the refuge would allow for an expansion of hunting and provide for some quality opportunities.

The biggest restriction to a quality hunt is the limited staffing currently available. Much needs to be done to provide information needed by hunters—not the least being a clear and understandable handout with map, rules, and regulations, along with signing refuge boundaries and closed areas. Pulling staff from other areas of the complex to complete work for hunting may limit other wildlife-dependent public uses, although all can use some hunting resources (such as a public use handout).

Rationale 144 (all alternatives): To continue this use and instill a conservation ethic into future citizens, the refuge can provide quality hunting experiences that would encourage and teach youth the pleasures and responsibilities of hunting.

The refuge is in a beautiful Intermontane valley with quality opportunities for hunting. It is also remote, which provides for uncrowded hunting opportunities. This presents a good opportunity to introduce youth to hunting as well as foster a sense of appreciation

and stewardship to the refuge and its mission of protecting fish, wildlife, and plants for future Americans.

This program needs to have adequate staffing to contact the majority of youth involved in these early hunts, to impart messages of conservation and ethical behavior. The refuge would need to partner extensively with MFWP and others to ensure the success of this program.

FISHING

Rationale 145 (alternatives A, B, and C): Promoting youth fishing is an opportunity to introduce future generations to the pleasure and excitement of fishing. Those involved would not only learn how to fish successfully but ethically as well.

Rationale 146 (alternatives A, B, and D): Fishing is one of the six wildlife-dependent recreational public uses defined in the Improvement Act. A quality program is a good way to help foster appreciation, support, and understanding of the refuge, the Refuge System, and the Service.

An effort should be made to accommodate fishing as long as it is compatible with resources and other wildlife-dependent public uses. At this time, there are no viable sport fishery opportunities at the refuge, due in large part to past land practices that changed the hydrology of Dahl Lake, Pleasant Valley Creek, and the watershed downstream.

Rationale 147 (alternative C): A goal of the National Wildlife Refuge System is to conserve and restore representative ecosystems. With the acquisition of Lost Trail into the Refuge System, there is an opportunity to restore the hydrology, fisheries, and riparian communities on the refuge.

While fishing is considered an appropriate, wildlife-dependent, recreational public use under the Improvement Act, it is a consumptive use and would not fit under alternative C. The mandate to provide quality fishing opportunities would not be supported in this alternative. The natural water regimes, and their corresponding fisheries and plant communities, have been greatly modified in Pleasant Valley and do not support a quality fishing program.

WILDLIFE OBSERVATION AND PHOTOGRAPHY

Rationale 148 (all alternatives): Wildlife photography and observation are two of the six priority wildlife-dependent recreational public uses as defined in the Improvement Act. They should be provided for if found compatible and if the refuge has the resources to support them.

Rationale 149 (all alternatives): Information would be provided to visitors to enable them to pursue high-quality wildlife-dependent recreational activities while connecting to resources. This would

provide opportunities for them to develop an understanding and appreciation for natural and cultural resources. In addition, visitors would have information on how to use the refuge in an appropriate and compatible manner.

Rationale 150 (alternatives A, B, and C): Wildlife photography, wildlife observation, and interpretation are a great means of fostering understanding and instilling an appreciation of native fish, wildlife, and plants and their conservation. Providing the public with a safe, quality wildlife observation and photography experience includes following ethical behavior that results in minimal disturbance to wildlife and plants.

Rationale 151 (alternatives A, B, and C): Promoting wildlife photography and observation of plants, animals, and their associated habitats can foster an understanding of and increase public appreciation for America's natural resources and the role of the Refuge System in managing and protecting these resources. The refuge is part of an Intermontane ecosystem that typically has been used for farming and ranching. The refuge offers a unique opportunity for the public to view plants and animals in a natural ecosystem setting.

Rationale 152 (alternative A): Alternative A provides opportunities for quality public use experiences by opening the refuge to public access while minimizing disturbance to wildlife during critical periods of their biological cycle. Limiting disturbance, combined with habitat improvements, would maintain or increase populations. Ultimately, wildlife photography and observation opportunities would be improved.

Uplands would be open to authorized public uses throughout the year, except access would be restricted to designated trails and roads from December 15 through April 1 to protect wintering wildlife from disturbance.

Winter is a critical time for ungulate survival due to increased energy requirements related to searching for food and higher metabolic rates associated with maintaining body heat. Disturbance at this time results in even greater energy requirements and may weaken the animal to the extent that reproduction is compromised or individual survival is threatened. The greatest disturbance comes from unpredictable and erratic occurrences. Restricting public use to designated trails and roads would eliminate the most deleterious disturbance while still providing recreational opportunities.

The area between the county road and the South Pleasant Valley road, and areas around facilities, would be closed to all public access from September 1 through December 15. Authorized public uses would only be permitted on designated trails and roads from December 15 through April 1 to protect wintering ungulates from disturbance (as described

above); and from May 15 through September 1 to protect nesting waterfowl and other wetland- and bottomland-associated species from disturbance.

Effects on breeding waterfowl from human disturbance include: (1) a reduction in the number of pairs using the area; (2) an increase in nest desertion; (3) a reduction in hatching success; and (4) a decrease in duckling survival. These factors lead to a decrease in waterfowl populations. By limiting access to designated trails and roads, disturbance would be confined to a narrow corridor along these routes. Waterfowl and other avifauna would have protected areas in which to nest and rear their young, securing future populations.

A balance that allows for quality public use opportunities without negatively affecting the resources is sought. This would ultimately ensure that wildlife viewing and photography would be available for future generations. The definition of “authorized access” (foot travel, snowshoes, skis, mountain bikes, and horses) would be determined in the appropriate step-down plan.

Rationale 153 (alternative B): Authorized public access (primarily foot traffic) would be allowed except for the bottomlands, which are closed from September 1 to December 15 and restricted to designated trail and road use only from May 15 to September 1. The remainder of the year they are open to access.

One of the main purposes for which the refuge was established was the protection and conservation of migratory birds—primarily those species associated with wetlands. Restricting public use to designated trails and roads from May 15 to September 1 would provide these species with a secure area to nest and raise their young protected from human disturbance. Disturbance during this critical time can affect nesting populations by: (1) causing pairs to leave the area resulting in a loss of nesting or nesting in marginal habitat; (2) causing females to abandon nests; (3) reducing hatching success by flushing females off of nests and exposing eggs and young to weather extremes and predators; and (4) decreasing duckling survival by splitting up family groups, exposing young to predators and starvation.

To optimize public use, the remainder of the refuge would be open to authorized public access. Authorized access (foot travel, snowshoes, skis, mountain bikes, and horses) would be determined in the appropriate step-down plan.

Rationale 154 (alternative C): Emphasis is placed on improving wildlife observation and photographic opportunities both on and off the refuge by fostering wildlife populations. Restricting public use to designated trails allows access to the public with minimal disturbance to wildlife. Viewing opportunities may improve as animals become habituated to

predictable disturbance in a given area. Protection from disturbance in conjunction with proposed habitat restoration should boost wildlife populations and increase public use opportunities.

Rationale 155 (alternative C): Visitors would receive the information needed to pursue the best possible wildlife observation and photographic opportunities. This could provide a connection to natural resources and provide chances for visitors to develop an understanding and appreciation for natural and cultural resources.

Rationale 156 (alternative D): Wildlife photography and observation are good means of fostering understanding and instilling an appreciation of native fish, wildlife and plants, and their conservation, by providing the public with safe, high-quality and compatible experiences. Users would be provided information to enhance their experience such as ideas on where they could go, what to expect, and the best area, times, and seasons to observe and photograph wildlife.

Rationale 157 (alternative D): Visitors would be provided with the information needed to pursue wildlife-dependent recreational activities and to use the refuge in an appropriate and compatible manner.

INTERPRETATION

Rationale 158 (all alternatives): Interpretation is a great way to relate the natural resources to visitors. It allows them to come to appreciate and support the management of the refuge. Interpretive materials would include information on best areas and times to receive quality experiences. Information would help reduce conflicts between users and reduce resource damage. It would provide the public with access to rules and regulations.

Rationale 159 (all alternatives): Interpretation is one of the six wildlife-dependent recreational public uses as defined in the Improvement Act. Well-designed interpretive services can be a most effective and inexpensive resource management tool. For many visitors, taking part in one or more interpretive activities is their primary contact with refuge staff and could be their first contact with the refuge, conservation, and wildlife.

There is an opportunity to foster a sense of understanding and appreciation of the refuge and the Service, as well as influence visitors' behaviors when visiting units of the Refuge System. Personal contact can help us make management decisions and build public support by providing insight into management practices.

Interpretive planning and subsequent activities and products can:

- help visitors understand the impacts of their actions, minimizing unintentional resource damage and wildlife disturbance;
- communicate rules and regulations so they relate to visitors, solving or preventing potential management problems;
- help the refuge make management decisions and build public support by providing insight into management practices.

Rationale 160 (alternatives A, B, and C): Wildlife conservation is the first priority of the System, and new and ongoing recreational use programs should help visitors focus on wildlife and other natural resources. Activities should make visitors aware of the most important resource issues at the refuge, be supportive of management plans that address those issues, and show how the refuge contributes to the mission of the Refuge System.

The refuge was established as partial mitigation for habitat and wildlife losses and impacts on Flathead WPA due to erosional losses caused by increased Flathead Lake water levels (due to the operation of Kerr Dam by the MPC). Prior to Service acquisition, the MPC, in partnership with the NRCS, worked to protect portions of the refuge by purchasing a wetland easement under the WRP. Continuing partnerships would deal with restoring the hydrology, wetland, and stream ecology of Dahl Lake and Pleasant Valley Creek.

The story of wetland mitigation and protection is an essential element to the establishment of this refuge. The visiting public should be exposed to this story and the partners involved.

ENVIRONMENTAL EDUCATION

Rationale 161 (all alternatives): Environmental education is one of the six appropriate wildlife-dependent recreational public uses as defined in the Improvement Act. Quality environmental education programs would promote understanding and appreciation of natural and cultural resources, and so foster support and stewardship of the refuge, Refuge System, and Service.

Rationale 162 (all alternatives): Due to its diversity of habitat and wildlife species, the refuge lends itself to quality, outdoor environmental education. Educational institutions presently schedule environmental education field trips to other land management units of the National Bison Range complex.

Rationale 163 (all alternatives): Interaction with the Montana Academy and other local schools would aid the refuge in providing environmental education opportunities, develop community support, and promote interest in future goals and projects. Children located in the Pleasant Valley would be able to further their appreciation for the

surrounding environment. In addition, this would help establish community support that would increase interest and understanding of the refuge and the Refuge System.

Rationale 164 (all alternatives): Creating and providing a lending library of materials and resources for teachers and other educators is a Service recommendation for providing a minimal environmental education program. The library would be a good way to provide educational materials geared toward the refuge and its natural resources and history. Library materials would provide background about the Service, which would help promote support and stewardship. The library would provide educators with materials to develop programs, and reinforce lessons learned during field trips. Library materials would include field guides and activities to use on site.

The Service recommends that field station environmental education programs, at a minimum, should include:

- creating or providing a lending library of materials and resources for teachers and other educators;
- designating a trained staff contact person for environmental education;
- designating a study site and providing stewardship opportunities;
- helping local educators identify refuge resources and develop programs;
- forming partnerships or recruiting and training volunteers including senior citizens and people with disabilities to conduct environmental education activities.

Rationale 165 (alternatives A, B, and C): Partnering would extend refuge funding and staffing to reach a wider audience.

Rationale 166 (alternatives A, B, and C): Opportunities for hands-on experience with the resource would foster appreciation and support of the refuge and the Service. Involving students in simple monitoring projects would instill a sense of ownership and stewardship to the resources. This is a good way to advance science literacy through an interdisciplinary educational approach.

Learning and stewardship activities with direct contact with the resource would provide opportunities to contribute to refuge management goals. These activities would allow students and educator to see the changes to the environment their assistance has produced. Long-term projects would reinforce conservation messages learned in the field. The projects would be a means to give educators experience to bring back to the classroom and add depth to their messages. In addition, the activities

would teach students and educators about resources while getting needed help for restoration projects.

Rationale 167 (alternative C): Providing environmental education in schools is one way to expose students without disturbing resources themselves. It would help foster stewardship among our future caretakers.

Rationale 168 (alternative D): The refuge offers many opportunities for local school students to use the refuge for various environmental education activities. This on-going activity fosters refuge–community relations, aids in student education, and provides awareness and appreciation of the Refuge System and mission in the local community.

ADMINISTRATION

OPERATIONS

Rationale 169 (all alternatives): The refuge manager currently directs, implements and supervises daily administrative, management, public use, and maintenance activities and operations of the refuge. In addition, the refuge manager coordinates these types of activities on five WPAs in Flathead County and on Swan River National Wildlife Refuge.

The following factors dictate the necessity of an on-site refuge manager for the life of this plan:

- the size of the refuge
- on-going administrative and operational activities
- required maintenance needs
- community interest
- potential environmental education and interpretative programs
- recreational opportunities
- proximity to rural communities as well as a major, growing metropolitan area (KalisPELL)

Rationale 170 (all alternatives): Volunteers assist in organizing and conducting programs such as limited environmental education programs with local schools, refuge interpretation, minor facility and equipment maintenance, and various wildlife surveys.

Rationale 171 (alternatives A, B, and C): The following factors justify consideration of Lost Trail National Wildlife Refuge with other Service land management units in Flathead County as a field station separate from the National Bison Range complex:

- size of the refuge
- level of daily operations
- planned staffing with subsequent supervisory responsibilities

- political “awareness and inherent sensitivity of refuge activities within the local area and the Columbia Basin Ecosystem”
- wildlife activities, interests and activities unique and particular to this area of northwestern Montana
- anticipated increased public use activities

Rationale 172 (alternatives A, B, and C): Increased management and administrative responsibilities associated with development of a new refuge necessitates the need for a GS-12 supervisory position to assist with directing all Refuge System programs and to meet the goals and mission of the Service.

Rationale 173 (alternatives A, B, and C): With the refuge being newly established, there is a multitude of resource data to be collected that would assist and enable refuge managers to properly manage the refuge in accordance with applicable laws and Service policy. A full-time wildlife biologist would implement the biological program including monitoring, evaluation, and analysis of all habitats and associated ecosystems (streams, wetlands, grasslands, and forested areas).

Rationale 174 (alternatives A, B, and C): Managing habitats to fulfill refuge purposes and prevent invasive plant destruction of ecosystem functions is necessary to meet the mission of the Refuge System. Development and administration of the public use program and facilities to provide the visiting public with a quality, safe, wildlife-dependent recreational experience is also necessary to meet the mission.

Rationale 175 (alternatives A, B, and C): Increased authorization of public recreational activities would result in a need for a full-time law enforcement presence to ensure a safe and enjoyable experience by refuge visitors while ensuring the protection of natural and cultural resources.

Rationale 176 (alternatives A, B, and C): Increased staffing, administration, public use programs, equipment, biological data collection, and monitoring would result in the need for additional administrative support to effectively communicate, budget, and perform time and attendance and hiring activities.

Rationale 177 (alternatives A, B, and C): Managing resources and infrastructure to meet Service guidelines and policies would require adequate maintenance staff with proper tools and equipment. Implement the refuge operating needs system project for acquiring appropriate equipment and supplies to maintain refuge habitats and public use facilities (i.e., purchase of herbicide sprayers, mower, and tractor; and recurring costs of herbicide, mechanical invasive plant control, biological invasive plant control, and public use facilities maintenance).

Rationale 178 (alternatives A, B, and C): The safe and efficient operation of the refuge is dependent on having the necessary equipment to carry on daily operations. It is necessary, practical, reasonable, prudent, and proper to maintain necessary vehicle, shop, and office equipment as funding allows.

Rationale 179 (alternative B): With the refuge being managed for maximum, compatible public use opportunities in alternative B, there would be a need to have on-site planning and implementation by professional public use staff. An outdoor recreation planner would implement the public use program including planning, implementation, monitoring, evaluation, and analysis of all public use activities in the north portion of the complex (in coordination with the outdoor recreation planner for the complex).

Rationale 180 (alternative B): Volunteers would assist staff with the public use program, allowing for increases in recreational opportunities for visitors. The Secretary of the Interior may establish a senior volunteer corps, consisting of volunteers over the age of 50. To assist in the recruitment and retention of the volunteers, the Secretary may provide for additional incidental expenses to members of the corps beyond the incidental expenses otherwise provided to volunteers [16 U.S.C. 742f (c)]. This would allow for interpretation and potentially a well-established visitor contact station.

Rationale 181 (alternative D): Lost Trail National Wildlife Refuge is a satellite unit of the National Bison Range complex. Funding for the refuge is appropriated from the overall appropriations of the complex; therefore, coordination with complex headquarters for equipment repair and replacement is necessary from a practical, budgetary standpoint. It is prudent and appropriate to maintain equipment in a safe and efficient manner for proper management of the refuge. Future funding levels are uncertain, thereby making routine maintenance and repair of existing equipment a priority to maintain operations.

Rationale 182 (alternative D): The biological program of the National Bison Range complex coordinates research, data gathering, inventory and monitoring, and information needs for the entire complex, which includes the refuge. With limited biological staffing, needs and opportunities require close coordination for scheduling, prioritizing, and completing. Baseline inventories have been initiated and would need to be continued in a standardized format. In addition, as management actions and restoration projects are begun, monitoring would be required.

Rationale 183 (alternative D): A biological technician is essential to daily operations. The position assists with normal, on-going refuge work activities such as conducting wildlife surveys, facility and equipment maintenance, posting, law enforcement, and invasive plant inventory and control.

Rationale 184 (alternative D): No full-time positions are approved for the refuge at this time. Administrative staff is located at the headquarters of the National Bison Range. This staff assists daily for budget, time and attendance, and hiring.

Rationale 185 (alternative D): Managing refuge resources and infrastructure to meet Service guidelines and policies require adequate maintenance staff with proper tools and equipment. A maintenance worker is desperately needed to maintain facilities, habitats, and provide visitor assistance.

FACILITIES

Rationale 186 (all alternatives): With the exception of the headquarters residence, office, shop, and storage buildings, use of the other refuge facilities is on an “intermittent, as needed” basis by staff of the National Bison Range complex, fire crews, and other agency personnel who periodically stay on-site to assist with various activities (e.g., maintenance and surveys). It is necessary to maintain these facilities (to avoid major, costly maintenance) until completion of the CCP and pertinent “best use” of the facilities is determined.

Rationale 187 (alternatives A, B, and C): Many structures and facilities were previously used in ranching activities. Many of these facilities:

- are in excess to Service needs and are occupying areas that potential grassland habitat;
- are detrimental as a wildlife hazard or a harbor for predators of ground-nesting birds;
- increase maintenance costs;
- increase fixed costs;
- detract from the natural appearance of the landscape.

By removing these structures and facilities, maintenance costs would decrease, unnecessary facilities would be eliminated, and habitat would be restored.

Rationale 188 (alternatives A, B, and C): To adequately manage programs, it is necessary to provide productive workspace supplied with the necessary equipment, tools, and supplies to accomplish refuge and Service objectives.

Rationale 189 (alternatives A and B): An increase in public use activities would necessitate design and development of additional public use facilities.

Rationale 190 (alternative B): No educational, recreational, or visitor contact facilities are presently available. To increase significantly the on-site educational and recreational opportunities, facilities must be constructed.

Rationale 191 (alternatives B and C): Roads and trails are necessary to conduct properly the daily, on-going refuge activities (i.e., invasive plant spraying, census, and surveys). An anticipated increase in public use activities would necessitate the need for an efficient and safe road system.

PARTNERSHIPS

Rationale 192 (all alternatives): Partnerships would assist in preserving resources of the Pleasant Valley ecosystem for future generations. The refuge was purchased subject to an existing WRP easement, therefore the refuge would abide by NRCS rules and regulations to restore the hydrology of the WRP easement area. The WRP project as a whole is important to the hydrology of the entire valley not just the WRP easement that lies within the refuge boundary. In working with these partners, restoration of hydrology and vegetation on and adjacent to the refuge would be an important step in restoring the ecosystem to historical conditions.

Rationale 193 (all alternatives): Assistance in all areas of invasive plant control must be coordinated to have the maximum possible impact within the Pleasant Valley. Working with the grant program provides needed funding. The refuge would seek to preserve the valley and the ecosystem for future generations to enjoy and use for recreation. To maintain the current working relationship within the Pleasant Valley is also a critical tool for proper management of the refuge. Use of road 1019 is permitted, however maintenance issues must be addressed annually.

The Service currently does not have staff and funding to maintain roads that are damaged or destroyed by partners—the issue of maintenance is addressed in the easement document that allows use of these roads. The easement document mandates that maintenance of specified roads be based on primary usage of these roads by refuge staff or partners that caused the damage.

In addition, keeping an open working relationship with partners would allow for future negotiations and consultations for the ensured preservation of the Pleasant Valley.

Rationale 194 (all alternatives): Grants allow for additional funding, which the complex lacks, for management issues. The RMEF has enthusiastic and willing volunteers that would assist with big game winter range improvement. Use of volunteers provides extensive help with little or no cost. This volunteer effort is critical for removing 75 miles of interior barbed wire fence, which currently hinders big game movement throughout the refuge.

Labor forces within the refuge are minimal. Crews such as Landmark Volunteers would be essential to

completing projects such as fence removal, facility maintenance, and other labor-intensive projects that would enhance wildlife habitat (i.e., removal of the East Cattle Station).

The refuge often times does not have enough staff to complete all monitoring and inventory needs. The National Audubon Society has people who are enthusiastic and generally knowledgeable about birds. With a little training from staff, this partnership would help establish baseline data needed for management decisions.

Additional funding would assist with other habitat management projects involving volunteers. The mission of the MCC is to bring together Montana's commitment to its people and its natural resources by enhancing citizenship and employability through stewardship of our lands and community service.

The model of the MCC is:

young people + hard work + meaningful projects
= *quality citizens and a better environment*

The refuge would help fulfill this mission with community service projects that would provide for habitat management benefits. Removal of fencing, and facility maintenance, are high priorities. The benefits are numerous since fence removal helps wildlife movement throughout the refuge, as well as reducing the number of unwanted fence lines within the boundaries of the refuge.

Allowing interest groups to assist with these types of projects would make them less expensive and more feasible to accomplish within a reasonable amount of time. In turn, this allows community members to be involved at the refuge with hands-on assistance.

Rationale 195 (all alternatives): DNRC and the Service have entered into a memorandum of understanding for wildland fire suppression on the refuge. Interagency wildland-fire suppression efforts are necessary due to lack of staff. DNRC is the logical choice since they maintain a fire station within 15 miles, allowing for 24-hour assistance and quick response during the fire season.

Rationale 196 (all alternatives): County road crews maintain Pleasant Valley Road, which traverses the refuge. Road issues and maintenance concerns should be discussed and dealt with on a regular basis. Due to the layout of the road, any problems with the road may be dangerous to refuge staff as well as the visiting public.

Rationale 197 (all alternatives): The refuge was acquired subject to the existing power line easement and, therefore, is legally required to abide by the existing terms of the easement.

Rationale 198 (all alternatives): The PCTC is the principle landowner surrounding the refuge. Grazing

on these lands is an annual occurrence from June 15 to October 15. Not all of the refuge is properly fenced, therefore continued coordination and discussions with the lessee is necessary to prevent trespass cattle.

Rationale 199 (alternatives A, B, and C): Development of a "friends group" would increase public awareness, involvement, and support. It would promote cooperation among varied conservation and environmental groups.

A "friends group" would improve the management and protection of the Refuge System by providing information to the administration and congressional decision makers. They can assist with influencing legislation that defines the future of the Refuge System. In addition, they can advocate for adequate funding and improved policy guidance for the Refuge System. They can participate actively in the development of a system management plan. They may also network with "friends groups" and support their actions on behalf of refuges.

Rationale 200 (alternatives A, B, and C): A working relationship with MFWP must be developed and maintained to ensure an ethical, lawful, and quality hunting experience—or there can be no hunting program on the refuge. Law enforcement personnel would be available for other enforcement needs.

Rationale 201 (alternatives A and C): The refuge was created to preserve habitat and the wildlife that uses it. Development in the area could potentially increase invasive plants, provide for more domestic animal conflicts, and increase disturbance to resident wildlife. This program would encourage the current land use of private lands and ensure the public value of the forests is protected. The group would protect critical wildlife habitat and conserve watershed functions, however it would maintain all recreation opportunities.

Rationale 202 (alternative B): Restoring a viable fishery population could increase chances of opening the refuge to fishing in the future. Since fishing is one of the six priority public uses that the refuge is required to address, this would be considered at all times during restoration and throughout this CCP.

Rationale 203 (alternative C): The mission of the refuge is to restore and protect.

Rationale 204 (alternative D): The refuge lacks proper staff and funding to maintain an adequate hunting program without assistance from MFWP. A working relationship with MFWP must be developed and maintained to ensure an ethical, lawful, and quality hunting experience. Law enforcement responsibilities would be shared with law enforcement personnel from the National Bison Range complex that are usually stationed at complex headquarters in Moiese, Montana (2.5 hours distant).

Appendix I—Refuge Operations Needs System Projects

<i>RONS¹</i> <i>Number</i>	<i>Project Description</i>	<i>First- year Need</i>	<i>Recurring Annual Need</i>	<i>FTE²</i>
00002	Provide a refuge manager to direct habitat management activities and develop public use programs	\$152,000	\$87,000	1.0
00004	Provide a biologist to conduct biological monitoring to improve habitat management plans for waterfowl, other migratory birds, native fish, and large mammals	\$151,000	\$10,000	1.0
00009	Provide an administrative officer to answer phones, respond to visitor questions, prepare administrative documents, and track budgets	\$ 54,500	\$22,000	0.5
00010	Provide maintenance activities on all structures, facilities and mechanical and chemical management of Refuge System lands administered from the refuge	\$119,000	\$54,000	1.0
00011	Provide a law enforcement officer to protect resources and provide for visitor safety on Lost Trail and Swan River national wildlife refuges	\$129,000	\$64,000	1.0
00012	Provide an outdoor recreation planner to develop public use plans for Lost Trail and Swan River national wildlife refuges and WPA	\$ 66,500	\$69,000	1.0
99002	Acquire and install boundary entrance signs	\$ 30,000	\$ 5,000	
	Provide a part-time coordinator to take full advantage of volunteerism and to expand into friends and support groups	\$ 66,500	\$34,000	0.5
	Provide an environmental education room and campground so that locals may use and learn from the refuge	\$ 60,000	\$ 5,000	—
	Construct pit toilets for public use facilities	\$ 45,000	\$ 5,000	—
	Develop a refuge brochure and video	\$ 51,000	\$ 3,000	—
	Fence the exterior boundary of the refuge	\$155,000	—	—
	Contract for a cultural resource survey	\$ 35,000	—	—
	Conduct a comprehensive vegetation inventory and assess current habitat condition	\$122,000	\$62,000	—
	Modify an existing building to provide a maintenance shop and construct a flammable storage building	\$520,000	\$30,000	—
	Improve many easement roads by purchasing dump trucks, gravel, and other needed equipment	\$310,000	\$10,000	—
	Enhance and assist the biological program by hiring a biological technician to assist with surveys, monitoring, and other work	\$ 94,000	\$54,000	1.0

¹RONS=refuge operating needs system

²FTE=full-time equivalent position

Appendix J—Maintenance Management System Projects

<i>MMS¹ Number</i>	<i>Project Description</i>	<i>Cost (\$)</i>
01006	Replace worn John Deere 410 backhoe/loader	80,000
01105	Rehabilitate deteriorated storage building complex	278,000
02007	Replace water well supplying water to residence #2	50,000
01099	Repair deteriorated horse ranch quarters	35,000
01108	Rehabilitate deteriorated boundary fence	202,000
02006	Replace quarters' roofing, guttering, furnace, and ductwork	35,000
01116	Repair deteriorated roads open to the public	350,000
02004	Remove nuisance east cattle station buildings and structures	30,000
02003	Rehabilitate office and visitor contact space to remove shelves	10,000
01098	Repair deteriorated water line system in horse ranch area	30,000
01100	Repair deteriorated exterior of headquarters quarters	35,000
01111	Remove nearly all interior fences	61,000
01011	Replace severely worn John Deere 544B front-end loader	101,000
01110	Remove unneeded cattle station water well	25,000
00002	Replace 1978 model case loader	125,000
01106	Remove unneeded frame wood shed at ranch headquarters	11,000
01107	Remove unneeded equipment shed at east cattle station	40,000
01104	Replace deteriorated shop at horse ranch area	329,000
01097	Replace deteriorated garage at horse ranch quarters	30,000
01102	Replace inaccessible ranch office space	71,000
02005	Remove small log building used as office space	25,000
99004	Develop and print refuge and WMD ² brochures for public use	41,000
		\$1,994,000

¹MMS=maintenance management system

²WMD=wetland management district

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