5 Environmental Consequences

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

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

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

5.1 Effects Common to All Alternatives

Some projected effects would be similar for all alternatives.

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

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

Cultural Resources

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

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

Potentially negative effects from construction of trails or facilities would require review by the regional archaeologist (region 6) and consultation with the Wyoming State Historic Preservation Office.

Environmental Justice

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

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

Air Quality

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

Global Warming

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

The use of prescribed fire, which releases CO_2, would result in no net loss of carbon because new vegetation would quickly replace the burned-up biomass. Overall, there should be little or no net change for carbon sequestered at the refuges from any of the management alternatives. As it relates to global climate change, the documentation of long-term changes in vegetation, species, and hydrology is an important part of research and monitoring. Adjustments in management may be necessary over time to adapt to a changing climate.

Soils

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

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

Water Quality, Wetlands, and Floodplains

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

Public Health and Safety

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

Socioeconomics

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

Economic Impacts

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

5.2 Description of Consequences by Alternative

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

The following section provides an analysis of the effects estimated to result from alternative A (no action), alternative B (proposed action), and alternative C. A summary of this narrative is contained in table 2 in chapter 3.

Alternative A—*No Action*

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

Upland Habitat Management

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

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

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

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

Wetlands and Alkali Flats Habitat Management

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

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

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

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

Water Rights

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

Threatened and Endangered Species

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

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

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

Habitat Protection

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

Invasive Species

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

Public Use

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

Research and Science

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

Cultural Resources

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

Partnerships

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

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

Refuge Operations

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

Socioeconomics

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

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

Alternative B—Proposed Action

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

Upland Habitat Management

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

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

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

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

Wetlands and Alkali Flats Habitat Management

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

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

Wildlife diversity would increase with more diverse wetland conditions.

Water Rights

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

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

Threatened and Endangered Species

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

Habitat Protection

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

Invasive Species

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

Public Use

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

Research and Science

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

Cultural Resources

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

Partnerships

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

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

Refuge Operations

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

Socioeconomics

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

Alternative C

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

Upland Habitat Management

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

Wetlands and Alkali Flats Habitat Management

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

Water Rights

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

Threatened and Endangered Species

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

Habitat Protection

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

Invasive Species

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

Public Use

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

Research and Science

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

Cultural Resources

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

Partnerships

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

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

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

Refuge Operations

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

Socioeconomics

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

5.3 Cumulative Impacts

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

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

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

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