

CHAPTER 3—Alternatives



John and Karen Hollingsworth / USFWS

Pair of Blue-winged Teal

The purpose of this chapter is to describe the management alternatives considered for the Bowdoin National Wildlife Refuge Complex, Montana. Alternatives are different approaches to unit management that are designed to achieve the refuge complex purposes, vision, and goals; the mission of the Refuge System; and the mission of the Service. Alternatives are developed to address the substantive issues, concerns, and problems identified by the Service, the public, and other partners during public scoping and throughout the development of the draft CCP.

Two topics received separate analyses: (1) the proposed divestiture (the selling or release of Service interests) of Lake Thibadeau National Wildlife Refuge (refer to section 3.1 below); and (2) the proposed action related to the salinity and blowing salts issue at Lake Bowdoin on the Bowdoin National Wildlife Refuge (refer to chapter 6). Alternatives A–C for the refuge complex, as described in section 3.3 below, apply to the remaining four refuges and one wetland management district in the refuge complex. The salinity and blowing salts alternative supports the actions outlined in alternative B (proposed action) for the refuge complex.

3.1 Divestiture of Lake Thibadeau National Wildlife Refuge

The Service developed two alternatives for the proposal to divest Lake Thibadeau National Wildlife Refuge: (1) keeping the refuge, with little to no maintenance of facilities; and (2) divesting the refuge and voluntarily relinquishing the water right back to the State.

Lake Thibadeau Refuge Alternative 1 (Current Management—No Action)

Lake Thibadeau National Wildlife Refuge would continue to be an easement (limited-interest) refuge comprised almost exclusively of private lands encumbered by refuge and flowage easements. These easements only provide the Service the right to impound water and to control the uses that occur on that water. The Service also has the right to control

hunting and trapping. The easements do not allow the Service to control any uses that occur on the uplands, including agricultural uses and development. The refuge would continue to not achieve its purposes as a resting place for migratory birds and wildlife due to almost a complete loss of wildlife habitat, primarily due to extensive development and agricultural use. The Service would minimally maintain the dams, spillways, and water control structures, even though most water resources no longer reach this impoundment due to upstream development. The landowner would continue to control access to the refuge. The 19.42 acres reserved from public domain lies in the center of the refuge and would remain inaccessible to the public.

Lake Thibadeau Refuge Alternative 2 (Divestiture– Proposed Action)

The Service would divest its interest in Lake Thibadeau National Wildlife Refuge, removing it from the National Wildlife Refuge System. The planning team used the Service's Mountain–Prairie Region divestiture model to make this initial deter-

mination. The full analysis and resulting documentation are in "Appendix E–Divestiture Model Results for Lake Thibadeau National Wildlife Refuge." This proposal was further evaluated through an analysis of the consequences of maintaining or divesting this refuge (summarized in table 4). This combined analysis determined that the refuge cannot achieve its purposes nor does it meet any of the goals of the Refuge System. If divested, the easements would be relinquished and all rights returned to the landowner. The dams, spillways, and water control structures would be transferred to the landowner or removed, and the water rights would be voluntarily relinquished to the State of Montana. This divestiture would be carried out within 5 years of CCP approval. To prepare the final divestiture proposal, the refuge staff would work with the Mountain–Prairie Region's Division of Realty and Division of Refuge Planning to prepare a full divestiture proposal. The divestiture of Lake Thibadeau National Wildlife Refuge would require an act of Congress.

Summary

Table 4 summarizes the analysis of two alternatives for management or divestiture of Lake Thibadeau National Wildlife Refuge.



Table 4. Comparison of alternatives and environmental consequences for keeping or divesting Lake Thibadeau National Wildlife Refuge, Montana.

<i>Lake Thibadeau Refuge alternative 1 (current management—no action)</i>	<i>Lake Thibadeau Refuge alternative 2 (divestiture—proposed action)</i>
Habitat and wildlife—actions	
<p>Due to limited water resources caused by upstream development, maintain only passive management of the impoundment. Minimally maintain the dams and water control structures when funding is available but as a low priority compared with other maintenance needs.</p> <p>Continue to retain the authority to control hunting, trapping, and the uses that occur on the water. The landowner would continue to retain the authority to control all other uses that occur on the uplands. Due to the poor quality of wildlife habitat, acquire no lands or waters within the refuge through fee-title or easement programs.</p>	<p>Divest this limited-interest refuge and revoke the easements. Voluntarily relinquish water rights to the State.</p> <p>Turn over to the landowner, or remove, the dam and other structures.</p> <p>Revoke the 19.42 acres of land reserved from public domain.</p>
Habitat and wildlife—environmental consequences	
<p>Management and use of the uplands would continue to be under complete control of the landowner, excluding hunting and trapping.</p> <p>No nesting habitat would be available for waterfowl and other grassland-dependent birds, including in the uplands adjacent to the impoundments and wetlands. Waterbird use on the impoundments would continue to be minimal, similar to that found on stock water ponds found around the refuge.</p> <p>The refuge would continue to not meet its purpose as a refuge and breeding ground for migratory birds and other wildlife.</p>	<p>Same as alternative 1, <i>plus</i>:</p> <p>The potential removal of the water control structures, dams, and water delivery would remove the ability to artificially impound and divert water. Waterbirds that might have used this water for loafing would likely relocate to other similar stock water ponds off the refuge. Wetland basins would most likely revert back to natural hydrologic periods.</p> <p>If the structures were retained, the landowner would be responsible for the maintenance.</p> <p>The Service would no longer use limited staff and resources on a refuge that does not support any goals of the Refuge System.</p>
Visitor services—actions	
<p>Continue to allow hunting with access controlled by the landowner.</p>	<p>Same as alternative 1.</p>
Visitor services—environmental consequences	
<p>The landowner would continue to control public access to the refuge for all visitors, providing little to no recreational opportunities.</p> <p>Most visitors would remain unaware that these private lands are even part of the Refuge System due to the lack of wildlife habitat and access to these private lands.</p>	<p>Same as alternative 1.</p>
Cultural resources—actions	
<p>Provide minimal protection as required by existing laws on the portion of Service-owned land reserved from public domain and the dams and other water control structures covered under the flowage easement.</p>	<p>The landowner would have responsibility to protect cultural resources as required by law on private lands.</p>

Table 4. Comparison of alternatives and environmental consequences for keeping or divesting Lake Thibadeau National Wildlife Refuge, Montana.

<i>Lake Thibadeau Refuge alternative 1 (current management—no action)</i>	<i>Lake Thibadeau Refuge alternative 2 (divestiture—proposed action)</i>
Cultural resources—environmental consequences	
<p>The refuge staff would continue to consult with the regional archeologist on any repairs and or improvements to water control structures, dams, or water delivery canals that may be determined eligible for the National Historic Register. The Service archeologist would prepare documentation to meet the requirements under the National Historic Preservation Act for such structures.</p>	<p>Divestiture of the water control structures, dams and water delivery canals at Lake Thibadeau would be an adverse effect to the property under the National Historic Preservation Act and would require mitigation. Mitigation would entail consultation with the Montana State Historic Preservation Office and Advisory Council on Historic Preservation to determine the appropriate measures that would satisfy all the consulting parties.</p> <p>On completion of the mitigation, relinquishment of the easement would not leave the landowner with any mandatory responsibilities to maintain the historic value of the property. Landowner responsibilities as they pertain to the eligible historical structures would be provided to them once the Service completes the required mitigation.</p> <p>Once the Service meets the mitigation requirements of the National Historic Preservation Act, the landowner may remove any structures they would not need.</p>
Operations—actions	
<p>Rehabilitate only those dams, spillways, and water control structures that pose a threat to health and safety.</p>	<p>Give control of structures to the landowner or remove.</p>
Operations—environmental consequences	
<p>The maintenance or removal of water control structures, dams, and water delivery canals would continue to be the responsibility of the Government.</p> <p>Dam inspections would continue to occur every 4–6 years to inspect and identify deficiencies. Repairs would only occur if money became available; maintenance of these structures would be a low priority compared with other maintenance.</p>	<p>The landowner would maintain any structures, dams, and canals necessary for their needs.</p> <p>If the landowner does not want to maintain these structures, the Service may remove them before divestiture, removing any capability to store even limited water resources that could be used by the landowner for agricultural purposes.</p>
Partnerships—actions	
<p>Continue communication with landowners only when updates to the Emergency Action Plan for the Lake Thibadeau Diversion Dam are made.</p>	<p>The Service would work with the landowners throughout the divestiture process.</p>
Partnerships—environmental consequences	
<p>The Service would continue to provide the landowners annual updates to the Emergency Action Plan and the Standard Operating Procedures for the Lake Thibadeau Diversion Dam.</p>	<p>The Service would work with the landowners throughout the divestiture process so they understand the process and the rights that would be returned to them.</p>
Easement rights—actions	
<p>Maintain the right to impound water and to control hunting, trapping, and the uses that occur on the water.</p>	<p>Give the rights acquired in the easement agreements back to the landowner.</p> <p>Voluntarily relinquish the water rights to the State.</p>

Table 4. Comparison of alternatives and environmental consequences for keeping or divesting Lake Thibadeau National Wildlife Refuge, Montana.

<i>Lake Thibadeau Refuge alternative 1 (current management—no action)</i>	<i>Lake Thibadeau Refuge alternative 2 (divestiture—proposed action)</i>
Easement rights—environmental consequences	
<p>The Service would maintain the flowage rights to impound water on the land and to inspect and correct deficiencies to the water control structures, dams, and water delivery canals.</p> <p>The water resources that reach the impoundment would continue to be minimal due to upstream development.</p>	<p>The landowner would no longer be required to hold water.</p> <p>The landowner would have control over hunting, trapping, and the uses that occur on the water.</p>
Socioeconomics—actions	
<p>Continue with no public access to the refuge.</p> <p>Minimally maintain wetland management structures as money becomes available.</p>	<p>Remove the wetland management structures or transfer ownership to the landowner if they wish to retain the ability to capture the limited water resources.</p>
Socioeconomics—environmental consequences	
<p>There would be no economic benefits to the Service or public in retaining this refuge in the Refuge System.</p> <p>Most of the public would continue to be unaware this area is a wildlife refuge.</p> <p>There would be costs associated with maintaining the structures, which would lessen the Service’s ability to enhance more productive areas on the refuge complex.</p>	<p>The Service could use money that may be allotted for maintaining these impoundment structures on other more critical, productive projects, which may provide additional areas for the public to enjoy wildlife and their habitats.</p> <p>If the landowners choose to retain the impoundments, they may have some costs associated with maintaining the structures.</p>

3.2 Development of Alternatives for the Refuge Complex

The alternatives represent different approaches for permanent protection and restoration of fish, wildlife, plants, habitats, and other resources. The Service assessed the planning issues identified in chapter 2, the existing biological conditions described in chapter 4, and external relationships affecting the refuge. This information contributed to the development of alternatives; as a result, each alternative presents different approaches for meeting long-term goals. Each alternative was evaluated according to how well it would advance the vision and goals of the refuge complex and the Refuge System and how it would address the planning issues.

Each of the three alternatives incorporates various concepts and approaches intended to achieve the goals for the refuge complex outlined in chapter 2 and is discussed in terms of how it could meet each goal.

Alternative A, the no-action alternative, describes the current, ongoing management activities throughout the refuge complex. This alternative

might not meet all the CCP goals. It is provided as a basis for comparison with the other alternatives.

Alternatives Considered but Eliminated

There were no alternatives considered but eliminated from detailed study.

3.3 Description of Alternatives for the Refuge Complex

This section describes the alternatives considered by the planning team to achieve the proposed vision and goals and to address the issues. These alternatives include not only the current management (alternative A) but also the Service’s proposed action (alternative B), which reflects the draft CCP and is further described in chapter 7. Table 5 in section 3.4 below has a summary of the alternatives’ actions with associated consequences. Details about the consequences are in “Chapter 5—Environmental Consequences.”

The following alternative descriptions summarize each alternative's focus, and then provide details related to meeting each goal for the refuge complex.

Elements Common to All Alternatives

There are some consistencies in the three alternatives. For example, all alternatives including the no-action alternative emphasize the same target species and protection of threatened and endangered species. This section identifies the following key elements that will be included in the CCP regardless of the alternative selected:

- The Service would ensure that management of the refuge complex complies with all Federal laws and regulations that provide direction for managing units of the Refuge System.
- Each alternative would attempt to eradicate invasive species through an integrated pest management approach that includes biological, chemical, and mechanical treatment methods.
- No adjacent landowners would be adversely affected by any action taken by the Service without a mutual agreement and adequate compensation.
- Each alternative would provide equal protection and management of cultural resources.

Alternative A (Current Management—No Action)

Alternative A is the no-action alternative, which represents the current management of the refuge complex. This alternative provides the baseline against which to compare the other alternatives. It also fulfills the requirement in the National Environmental Policy Act that a no-action alternative be addressed in the analysis process.

Under alternative A, management activity being conducted by the Service would remain the same. The Service would not develop any new management, restoration, or education programs at the refuge complex. Current habitat and wildlife practices benefiting migratory species and other wildlife would not be expanded or changed. The staff would perform limited, issue-driven research and monitor only long-term vegetation change. No new funding or staff levels would occur and programs would follow the same direction, emphasis, and intensity as

they do at present. The Service would continue to manage the Black Coulee, Creedman Coulee, Hewitt Lake, and Lake Thibadeau National Wildlife Refuges as unstaffed satellite refuges.

Upland Habitat and Associated Wildlife

The following upland habitat discussion covers native grassland, disturbed grassland, invasive species, shelterbelts, habitat protection and acquisition, and greater sage-grouse.

Native Grassland. With available staff and funding, the Service would continue to manipulate native grasslands using various techniques including prescribed fire, treating invasive plants, grazing, and resting periods.

Currently, most management actions are based on outside research and do not follow an established management plan. Approximately 10 percent of the refuge complex's uplands would continue to be grazed periodically. When management actions such as grazing or burning do occur, there would be minimal evaluation of habitat response.

Disturbed Grassland. Disturbed grasslands are areas that were once native prairie, were converted to cropland, and then were planted to a mix of nonnative pasture grasses, also called DNC (dense nesting cover). Disturbed grasslands would continue to be treated periodically using various techniques including prescribed fire, treating invasive plants, grazing, haying, and resting periods.

As resources became available, cropland on waterfowl production areas would be restored to native grasses and forbs; however, DNC would continue to be seeded on highly erodible lands in the wetland management district. Dense nesting cover fields on Bowdoin Refuge would be converted to native forbs and grasses.

Invasive and Nonnative Plant Species. The Service would continue to use mechanical and chemical methods to control existing and new Russian olive infestations. Control would continue to be focused within the interior of the management units, with priority given to those areas where tree removal would result in large contiguous blocks of native grassland. The control effort would continue to be slow and inefficient due to a lack of staff and funding to address the tremendous expanse and invasion by these nonnative trees.

Early detection and rapid response would continue to be used to attack initial infestations of invasive plant species such as leafy spurge, perennial pepperweed, and spotted knapweed. Larger infestations of invasive plants such as crested wheatgrass would continue to be given little to no attention due to the extent of infestation and the lack of resources and staff.

Shelterbelts. The only management of shelterbelts on Service lands within the refuge complex would be the continued, systematic removal of non-native Russian olive trees.

Habitat Protection and Acquisition. The highest priority would be to continue the annual protection and enforcement of current Service grassland and wetland easements. The refuge complex would continue to seek potential grassland and wetland easement acquisitions from willing sellers, as time and staff permits. As funding and opportunities arise, the priority for fee-title acquisition would be given to acquiring inholdings from willing sellers that are adjacent to or within the boundary of the refuges and waterfowl production areas.

Greater Sage-Grouse. The Service would continue to provide and protect the existing habitat for greater sage-grouse but no sagebrush restoration efforts would be conducted.

Wetland Habitat and Associated Wildlife

The following wetland habitat discussion covers managed wetlands, natural wetlands, riparian habitat, water rights, habitat protection and acquisition, wildlife disease, invasive species, and threatened and endangered species.

Managed Wetlands. These are wetlands (natural or created) that have been enhanced to provide for water delivery to them or manipulate water levels by means of a water control structure using such

mechanisms as stoplogs or screw gates (hydraulic engineering control elements that are used to adjust water levels or flow rates). Management of enhanced wetlands would attempt to mimic natural wetland conditions that provide migratory waterbirds with spring and fall migration habitat, as well as breeding and nesting habitat. Effective management of these wetlands within the refuge complex is limited by the Service's available water and funding.

Bowdoin National Wildlife Refuge would continue to receive 3,500 acre-feet of water annually to manage all its wetland units including Lake Bowdoin. This use is part of Reclamation's water right that was made available to the Service through the negotiated MOA. Lake Bowdoin would remain a closed wetland system with no intentional water release into Beaver Creek to improve water quality.

The Service would continue to exercise its water rights on all of its waterfowl production areas in the refuge complex for the benefit of migratory birds and its associated habitat. Due to the vast area, lack of resources, and limited staff, there would be minimal monitoring of the response to these management actions. This monitoring would primarily consist of spring surveys of waterfowl and other breeding birds.

Most water management structures (such as dikes and levees) would remain in good working order due to recent repairs and upgrades completed through annual deferred maintenance funding and partnerships. The infrastructure of water manage-



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This bay structure allows water into Dry Lake from Lake Bowdoin via the conveyance channel.

ment facilities would continue to be maintained as needed and as funding became available.

Water elevations in the wetlands would be monitored to aid in the manipulation of managed wetlands to meet habitat objectives.

Natural Wetlands. There is no single scientifically acceptable definition of all wetlands because of their tremendous diversity and because they lie along a continuum or gradient between deepwater habitats and uplands or between purely aquatic and terrestrial ecosystems (Cowardin et al. 1979). According to Cowardin et al. (1979), wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For the purpose of this plan, natural wetlands refer to those various types of wetlands that have not been enhanced or drained.

Under alternative A, natural wetlands would continue to be monitored for invasive plant species and wildlife use. Management practices such as prescribed burning, grazing, and invasive plant control would be used to maintain and restore the productivity of these wetlands for migratory bird habitat.

Potential sites for wetland restoration have been identified throughout the refuge complex; these sites would be restored if additional money became available. Through partnerships and grants, the Service would pursue resources to identify and protect critical wetland complexes for breeding and nesting waterfowl through easements or fee acquisition.

Riparian Habitat. Refuge and waterfowl production area boundaries would continue to be fenced to eliminate the negative effects of trespass livestock grazing. Riparian areas would continue to be allowed to rest and revegetate naturally. The Service would use early detection and rapid response (chemical, biological, and mechanical methods) to treat initial infestations of invasive plant and mammal species.

Water Supply and Rights. The Service would continue to exercise its water rights in the refuge complex, including the Reclamation right available to Bowdoin Refuge through the MOA, to provide habitat for migratory birds using ground water wells, low-lift pumps, water conveyance systems, and delivered water from the Milk River Project when water is available.

Habitat Protection and Acquisition. The Service would continue to protect native prairie and natural wetlands within the Bowdoin Wetland Management District through easements and fee-title purchases from willing sellers within refuge acquisition boundaries and the Bowdoin Wetland Management District. The priority for acquisition money would be to buy borderlands from willing sellers (including "round-outs") that make it difficult to manage and protect refuge boundaries. The remaining priori-

ties would be to acquire, in order, inholdings, new wetland and grassland easements, and waterfowl production areas. The Service would annually monitor all new and existing wetland and grassland easements for compliance.

Wildlife Disease. To minimize or deter avian botulism outbreaks on Bowdoin National Wildlife Refuge, the Service would continue to avoid water-level fluctuations during the summer months (mid-May until early September) when conditions are favorable for botulism outbreaks. This would keep the number of birds exposed to this disease to a minimum. Refuge staff would monitor wetlands on Bowdoin Refuge for bird mortalities on a weekly basis throughout the summer months until the chances of an avian botulism or West Nile virus event are gone. Sample carcasses would be sent to the National Wildlife Health Center for analysis. An event history form would be completed for each outbreak; one copy would be sent to the National Wildlife Health Center and one would be placed in the refuge complex's filing system.

Refuge complex staff would continue to cooperate with the U.S. Interagency Avian Influenza Working Group to monitor the refuge complex for signs of avian influenza. The refuge complex's Disease Contingency Plan would be kept up-to-date and new policies would be adopted as needed. All staff would be trained to recognize the causes and effects of avian diseases, which would increase early detection of outbreaks.

Invasive and Nonnative Species. The Service would continue to use early detection and rapid response to treat initial infestations of invasive plant and mammal species. Chemical and mechanical treatments would be periodically used to set back invasive plants, and nonnative species such as Russian olive, as necessary to restore habitat for migratory bird use. There would be some mapping and monitoring completed throughout the refuge complex, primarily through the efforts of the Service's invasive species strike team.

Threatened and Endangered Species. The Service would continue to survey and monitor the activity of piping plover at the Bowdoin and Hewitt Lake National Wildlife Refuges. All documented piping plover nests would be monitored until chicks have fledged or the nest has been abandoned or destroyed. Nest cages would only be erected over nests that are in immediate danger of being trampled or of being destroyed by predators (other birds and mammals). The staff would continue to provide information on these monitoring activities to the Service's Division of Ecological Services and remain a member of the Montana Piping Plover Recovery Committee.

Visitor Services

The following visitor services discussion covers hunting and trapping, fishing, wildlife observation and photography, environmental education and interpretation, public access, and cultural resources.

Hunting and Trapping. The Service would continue to allow hunting of upland game birds and waterfowl in select areas of Bowdoin National Wildlife Refuge. The current hunting programs on the satellite refuges and waterfowl production areas would also continue at current levels, primarily following State seasons and limits. The public would continue to need landowner permission to access easement lands within the satellite refuges, and Holm WPA would remain closed to public hunting.

The late-season (starting no earlier than December 1) upland game bird hunt on Bowdoin Refuge would continue on those areas that are normally closed to public use. The first 2 days of this December hunt would continue to be designated for young hunters only. This special season would be contingent on all waterfowl having left the refuge, typically by November 30.

The Service would maintain the accessible boat dock and parking area on Lake Bowdoin and the accessible hunting and photography blind and parking area at Pearce WPA.

Hunters on Bowdoin National Wildlife Refuge would still be required to sign in and out at the hunter registration kiosk. Brochures with current public use regulations would be available at the registration kiosk and from the refuge Web site.

The Service would continue to issue special use permits to a limited number of trappers on Bowdoin Refuge to remove beavers and other burrowing animals that threaten to damage or cause failure of structures including water control structures, roads, dikes, and canals. This trapping program would also be used to help the Service in its efforts to control mammalian predators such as skunks and nonnative raccoons that are negatively affecting migratory birds. In these situations, the Service would continue to use only live traps to ensure that only targeted predator species are removed from the area.

In addition, trapping would also help reduce the spread of the diseases many of these predators carry. Trappers could continue to use body-gripping traps, commonly known as Conibear® traps, and live traps; leg-hold traps would continue to be prohibited.

In the establishing legislation, recreational trapping is permitted on the waterfowl production areas. Unless otherwise noted, the trapping season on these areas would continue to follow State regulations and limits.

Fishing. Recreational fishing opportunities would continue to be allowed along the Milk River at McNeil Slough WPA and along Beaver Creek at Beaver Creek WPA. The remainder of the wetlands within the refuge complex have minimal habitat or do not support game fish. Fishing would not be permitted at Bowdoin, Black Coulee, Creedman, Hewitt Lake, or Lake Thibadeau National Wildlife Refuges. These refuges have minimal habitat or high salinity levels, or both, and do not support game fish.

Wildlife Observation and Photography. The Service would maintain the following facilities for wildlife observation and photography: (1) the self-guided, 15-mile auto tour route and accompanying interpretive signs and brochure; (2) the accessible photo blinds at Bowdoin Refuge and Pearce WPA; and (3) the accessible Display Pond Trail, a national recreation trail, with observation deck and interpretive panel around Display Pond.

The Bowdoin Refuge bird list and the Northeastern Montana Birding Trail brochure would be updated as needed and made available to refuge complex visitors.

Environmental Education and Interpretation. Environmental education programs would continue to be opportunistic, presented as staff and time allow. Interpretive panels and brochures would be maintained and updated to reflect changes in information or policy and to meet the Service's graphic standards.

The Service would maintain the refuge Web site and provide periodic updates of news and activities for the refuge complex to the local media and chamber of commerce.

Public Access. The Service would continue to provide the current level of access throughout the refuge complex for visitors to participate in compatible, wildlife-dependent, public use activities. All areas within the refuge complex would continue to be open to foot traffic except for the area surrounding the shop, residences, and equipment storage.

Cultural Resources. The Service would continue to perform cultural resource inventories only as needed for compliance with section 106 of the National Historic Preservation Act and would continue using Montana's statewide inventory list of cultural resources to determine sensitive sites before activities. The refuge complex staff would continue documenting cultural resource sites that are found during the course of other duties and ensure their protection.

Partnerships

The following partnerships discussion covers partnership development and maintenance and energy development on Service lands.

Partnership Development and Maintenance. Existing partnerships would be maintained by combining resources and knowledge to achieve goals of mutual interest. Community-based public outreach programs would be conducted as time and staff allows.

Energy Development on Service Lands. Following current laws and policies, the Service would work with energy developers who are extracting reserved and excepted oil, gas, and mineral rights on grassland easements and fee-title lands to minimize impacts from their operations. Physical occupancy would be kept at the minimum space compatible with efficient mineral operation.

Operations

The following operations discussion covers staff, operations, facilities, and signs and boundary designation.

Staff. The current staff of five full-time employees would be maintained: a maintenance worker, an administrative officer, one refuge operations specialist with collateral law enforcement duties, a wildlife biologist, and a refuge manager (see table 8 under section 4.10 in chapter 4). The annual recruitment of up to two seasonal biological technicians, a maintenance worker, and one or more volunteers would continue only if funding were available. Due to the volume of maintenance projects, limited funds would first be used to continue recruiting for a 6-month seasonal maintenance worker. A biologist for the Partners for Fish and Wildlife Program would remain stationed at Bowdoin Refuge to work with private landowners and governmental and nongovernmental agencies to restore and create wetland and upland habitat on private and agency lands.

Operations. Money for operations would remain fairly consistent, except for some annual increases primarily due to inflation. Operations for the refuge complex would consist of maintenance of the following: (1) equipment such as vehicles and heavy machinery; (2) facilities including refuge housing and the headquarters; and (3) most of the management and public use structures such as dikes, roads, trails, and water control structures. Extensive replacement, repair, and rehabilitation of facilities and equipment would be completed as money became available.

Facilities. No additional facilities or infrastructure would be constructed unless money became available. Due to limited storage facilities, vehicles and equipment would continue to be stored outside year-round.

Signs and Boundary Designation. Most units in the refuge complex, including all waterfowl production areas, have both the proper entrance signs and boundary signs to orient visitors. Refuges that have

more than 40 percent of the land within the boundary in fee title have also been identified by entrance signs. Service boundary signs would continue to be replaced as needed, and boundary fencing would be maintained and replaced as time and staff allows. Entrance signs would be maintained and replaced if funding became available. Fences would be maintained to prevent trespass livestock grazing.

The Service would continue discussions with the landowner adjacent to Hewitt Lake National Wildlife Refuge to exchange fee-title lands needed to create a more manageable and enforceable refuge boundary and bring awareness of the effects of trespass livestock grazing.



Carmen Luna / USFWS

Alternative B (Proposed Action)

Alternative B for the Bowdoin National Wildlife Refuge Complex would conserve natural resources by restoring, protecting, and enhancing native mixed-grass prairie and maintaining quality nesting habitats for targeted migratory and resident birds within the refuge complex. There would be an increase in control and eradication of invasive plant species that are causing habitat fragmentation and impacts to grassland-dependent birds. These treated areas would be restored to native plant species, monitored, and treated for reinfestations. Enhanced wetlands would be managed to mimic natural conditions for wetland-dependent migratory birds during spring and fall migrations and during the breeding and nesting season.

For visitor services, the Service would develop additional access for visitors of all abilities to improve opportunities for wildlife-dependent uses (hunting, fishing, wildlife observation, photography, environmental education, and interpretation). These enhanced programs would encourage a greater understanding of the purposes of the refuge complex and an appreciation for Federal trust species including migratory birds, other native wildlife, the unique mixed-grass prairie, and the missions of the Service and the Refuge System.

The success of these additional efforts and programs would depend on added staff, research and monitoring programs, operations funding, infrastructure, and new and expanded partnerships. Appendix D contains the required compatibility determinations (draft) associated with this alternative.

Upland Habitat and Associated Wildlife

The following upland habitat discussion covers native grassland, disturbed grassland, invasive species, shelterbelts, habitat protection and acquisition, and greater sage-grouse.

Native Grassland. The Service would attempt to restore native grasslands by mimicking the natural processes of burning and grazing (including timing and frequency) to meet the specific habitat requirements of target species of resident and migratory birds and restoring the dominant historical plant communities that are still found within the refuge complex.

Using prescribed fire during bird-nesting seasons can lead to nest destruction or increased nest predation. Islands of unburned areas may be targeted by nest predators such as coyote, skunk, and raccoon. However, birds will typically re-nest but may produce fewer eggs. This initial loss of nests and potential reduction in production is offset in future years by improved habitat conditions, which lead to improved nesting conditions and numbers. Grazing may have similar effects due to trampling but, again, the long-term benefits eventually outweigh the short-term losses.

A grassland-habitat management plan (within the habitat management plan) would be completed based on tested methods for preserving and enhancing the native grassland habitats found throughout the refuge complex.

The Service would conduct research to determine the most effective methods for enhancing native species and addressing species that have become monocultures, such as clubmoss.

Disturbed Grassland. The Service would gradually convert disturbed grasslands to a diversity of grasses, forbs, and shrubs native to the site and that

have the greatest potential to survive and outcompete invasive species while providing habitat to targeted grassland-dependent migratory and resident birds. Invasive nonnative plant species would be controlled in all restored areas. Dense nesting cover would be seeded on highly erodible lands on the wetland management district.

Invasive and Nonnative Species. Same as alternative A, except that the refuge complex staff would work with the Service's Montana Invasive Species Strike Team and partners to ensure that treated areas are mapped, restored with native plant species, monitored, and re-treated (as necessary) to prevent reinvasion.

The Service would increase treatment of Russian olive, giving priority to areas where tree removal would create more contiguous blocks of grassland habitat. Through partnerships, the Service would develop an education and outreach program that discusses the impacts of Russian olive trees on native habitat and wildlife. In addition, the outreach program would provide information on native trees to plant (instead of nonnative Russian olive) for areas where trees were present historically.

The Service would conduct experiments to determine the best methods for reducing crested wheatgrass and for restoring treated sites to native grasses.

Shelterbelts. The Service would begin to systematically remove all shelterbelts in the refuge complex. These areas would be restored to native grasses, forbs, and shrubs to create more contiguous blocks of grassland habitat for targeted migratory and resident birds. Treated sites would be monitored for infestations of invasive plant species. Future shelterbelts of invasive species would not be permitted anywhere on the refuge complex.



Dr. Thomas G. Barnes / USFWS

Silver sagebrush is an important habitat component for sage-grouse.

Habitat Protection and Acquisition. Same as alternative A, plus the Service would use grants for acquisition of grassland easements and fee title from willing sellers. Future acquisitions would be prioritized by working with HAPET (Habitat Assessment and Population Evaluation Team) to identify the most critical waterfowl breeding and nesting sites that need protection. The Service would form partnerships with conservation groups to acquire lands for transfer.

Greater Sage-Grouse. Same as alternative A, except the Service would monitor greater sage-grouse population levels and trends. Sage-grouse habitat would be identified throughout the refuge complex and maintained or enhanced. Silver sagebrush would be planted on the Korsbeck and Beaver Creek WPAs to provide additional breeding, nesting, and feeding habitat for sage-grouse.

Wetland Habitat and Associated Wildlife

The following wetland habitat discussion covers managed wetlands, natural wetlands, riparian habitat, water rights, habitat protection and acquisition, wildlife disease, invasive species, and threatened and endangered species.

Managed Wetlands. Same as alternative A, plus the Service would acquire funding for a permanent maintenance worker and equipment necessary to maintain, repair, or replace water management structures. These improvements would be necessary to carry out the proposed changes to the wetland management program to provide quality habitat for targeted wetland bird species. Additional biological and refuge management staff would also be required to carry out and monitor the proposed enhancement, restoration, creation, protection, and maintenance of managed wetlands.

The Service would pursue funding to buy additional delivered water (when available) from the Malta Irrigation District for Lake Bowdoin during the spring or fall, or both seasons. This would be important to protect habitat for the threatened piping plover and other targeted wetland-dependent species.

New ground water wells would be developed to supplement wetland management needs. Water pumping sites would be developed at the Beaver Creek and McNeil Slough WPAs to create wetland habitat for migratory birds.

The Service would identify and map potential wetland enhancement projects that would protect critical wetland complexes for breeding and nesting waterfowl. Working with partners, the Service would pursue resources for easements or fee-title acquisition from willing sellers in these priority areas.

Natural Wetlands. Same as alternative A, except the Service would acquire additional money to restore natural wetlands used by migratory birds and other native species, primarily by treating invasive plants and noxious weeds that have impacted habitat quality. Additional biological staff would be needed to monitor and plan management of these natural wetlands.

Riparian Habitat. Same as alternative A, plus the Service would work with the Service's Montana Invasive Species Strike Team and partners to identify and map the locations and extent of invasive species in riparian areas. Treatments would be documented and sites would be restored with native plant species, and monitored (re-treating as necessary) to prevent reinvasion.

Water Supply and Rights. Same as alternative A, except the Federal reserved water rights and compact between the State of Montana and the Service for Bowdoin National Wildlife Refuge would be adjudicated. The Service would acquire more money to pay for added deliveries of water (beyond the original 3,500 acre-feet provided through the MOA with Reclamation) from the Malta Irrigation District when water is available and is needed to meet refuge habitat objectives.

Habitat Protection and Acquisition. Same as alternative A, plus the Service would work with partners and prepare grant proposals to pursue resources for acquisitions of grassland and wetland easements and fee-title lands from willing sellers. Future acquisitions would be prioritized by working with HAPET to identify the most critical waterfowl breeding and nesting habitat that needs protection.

Wildlife Disease. Same as alternative A.

Invasive and Nonnative Species. Same as alternative A, plus the refuge complex would work with the Service's Montana Invasive Species Strike Team and other partners to identify and map the locations and extent of invasive species within wetlands. Treated areas would be mapped and monitored and continue to be managed to prevent reinvasion. Russian olive trees and other vegetation that are impeding the function of water level management structures (such as dikes, ditches, and levees) would be removed.

Threatened and Endangered Species. Same as alternative A, except the Service would work with other agencies to acquire additional water resources and improve the current water delivery system, primarily to Piping Plover Pond, to better manage or increase piping plover habitat on Bowdoin National Wildlife Refuge.

Visitor Services

The following visitor services discussion covers hunting and trapping, fishing, wildlife observation

and photography, environmental education and interpretation, public access, and cultural resources.

Hunting and Trapping. Same as alternative A, plus the refuge would work with the State to determine the feasibility of providing an accessible and limited big game archery hunt on portions of Bowdoin Refuge currently open to public use. The refuge would address the safety of refuge visitors including hunters when making this determination.

Fishing. Same as alternative A.

Wildlife Observation and Photography. Same as alternative A, plus the Service would provide, at least monthly, wildlife observation programs for refuge complex visitors. These tours would be contingent on hiring a visitor services specialist. A new accessible observation site, parking area, interpretive kiosk, and two spotting scopes would be provided along the auto tour route at Bowdoin Refuge. The mammal, reptile, and amphibian lists would be updated for the refuge complex and a wildlife list would be developed in the Service's graphic standards.

Environmental Education and Interpretation. Same as alternative A, plus the Service would expand the environmental education and interpretation opportunities to further expand the public's appreciation and understanding of the resources of the refuge complex and the mission of the Refuge System. The staff would develop and present environmental education programs for students and adults primarily at Bowdoin Refuge and at off-refuge sites such as schools and local organization sites. Additional interpretive panels would be developed for the refuge complex.

The Service would develop a Friends group and work with the Malta Chamber of Commerce and Phillips County Historical Society to develop informational kiosks and interpretive displays to place in the town of Malta.

Many of these proposed actions would be contingent on hiring a visitor services specialist.

Public Access. Same as alternative A, except the east side of Bowdoin National Wildlife Refuge would be closed to all foot traffic from the start of the waterfowl season until at least November 30 to provide sanctuary, primarily for migratory waterfowl and shorebirds. The auto tour route through the closed portion of the refuge would remain open to vehicle traffic, but visitors would have to remain inside their vehicles.

The Service would work with Phillips County to rehabilitate the remaining portion of old U.S. Highway 2 that runs through the north end of Bowdoin National Wildlife Refuge.

The road and parking area on Black Coulee National Wildlife Refuge would be developed to

improve access for compatible wildlife-dependent activities.

Cultural Resources. The Service would complete a comprehensive cultural resource inventory for the entire refuge complex by working with the zone archeologist, contractors, local tribes, universities, and other partners to accomplish the project.

Partnerships

The following partnerships discussion covers partnership development and maintenance and energy development on Service lands.

Partnership Development and Maintenance. Same as alternative A plus, using the private lands and other programs, the Service would pursue additional partnerships to restore, maintain, and protect wildlife habitats on public and private lands, particularly those areas that impact refuge lands and waters. A partnership with Phillips County would be pursued to improve the surface of old U.S. Highway 2 through Bowdoin Refuge.

Energy Development on Service Lands. Same as alternative A, plus the Service would determine the energy development potential and the associated impacts of all proposed fee-title or easement acquisitions as part of evaluating and prioritizing these opportunities. When the policy on energy development on Service lands is completed, the refuge would modify its program to support the direction and objectives of this new policy.

Operations

The following operations discussion covers staff, operations, facilities, and signs and boundary designation.

Staff. Same as alternative A, plus the Service would add to the refuge complex's current staff an additional six and one-half permanent, full-time positions to achieve the goals and supporting objectives described in this alternative: (1) one maintenance worker, WG (Wage Grade)—4749-08; (2) one park ranger (visitor services specialist), GS (General Schedule)—025-09; (3) one refuge manager, GS-485-13; (4) current wildlife biologist position upgraded to GS-486-12; (5) one law enforcement officer, GS-025-09; (6) one biological science technician, GS-404-08; (7) one office automation clerk, GS-326-07; and (8) one permanent-seasonal maintenance worker, WG-3502-05. The current administrative support assistant position would be upgraded to a GS-9 administrative officer, and the current G-12 refuge manager position would be converted to a supervisory wildlife refuge specialist, functioning as the deputy refuge manager. Additional funding



Mike Artmann / USFWS

Clumps of Baltic rush (middleground) and bulrush (background) grow on the southern tip of Lakeside unit, an area that floods when the refuge pumps water in the spring.

would be required to recruit four seasonal biological science technicians. Volunteers would be recruited from universities and colleges throughout the region and from local communities. In addition, the Service would work with universities to develop a volunteer program that would provide college credits in exchange for volunteer work experience. With additional funding, the Youth Conservation Corps program would be reinstated with at least four youth positions and one social services aid, GS-186-05, to head the program.

Operations. Same as alternative A except additional resources would be pursued to achieve refuge and district purposes and achieve the goals, objectives, and strategies identified for this alternative. This alternative would require additional equipment and five additional vehicles for added staff. Outdated heavy equipment such as the road grader, scraper, farm tractor, and front-end loader would be replaced. Attachments for the farm tractor would be needed for habitat management purposes (for example, farm disc, grapple fork, and mowers). The Service would buy a mower and marsh master to

manage vegetation in wet areas for control of undesirable plant species and to create open-water habitat. The additional maintenance staff would operate and maintain this new equipment.

Facilities. Same as alternative A, plus facilities would need to be expanded or enhanced to accommodate the additional staff with equipment and an expanded visitor services program. The energy supplied to the Bowdoin Refuge headquarters, apartment, two houses, and shop buildings would be converted to more “green” technologies such as solar and wind power. A separate ground water well would be needed for the two refuge complex residences. The bunkhouse would be expanded to accommodate up to 8 people. One site with a concrete pad, septic and water systems, and electricity would be developed to accommodate a volunteer with a recreational vehicle.

The Service would construct one 10-bay storage facility for existing vehicles plus five additional field vehicles for new staff. An additional four-bay cold storage building would be needed to house additional heavy equipment.

New interpretive display and education materials would be added to the current visitor contact area. The public access road and parking at Black Coulee Refuge would be expanded and improved.

Signs and Boundary Designation. Same as alternative A, plus the Service would evaluate the need for existing fencing to manage a prescriptive grazing program. The retained fencing would be systematically replaced using wildlife-friendly materials and techniques including replacing the bottom fence wire with smooth wire and placing it no less than 18 inches from the ground.

Alternative C

Under alternative C, tame grasslands would be systematically restored to native species to provide the diverse habitats needed for target species of resident and migratory birds. Additional water management infrastructure (such as water delivery systems, dikes, and levees to manipulate individual wetlands) would be developed to create a more diverse and productive wetland complex. Biological staff would monitor the level of sedimentation occurring in natural wetlands and plan for its removal to restore the biological integrity of these wetlands.

Through partnerships, the Service would increase the acreage of invasive and nonnative species treated annually with an emphasis on preventing further encroachment of crested wheatgrass and Russian olive into native grassland. The Bowdoin Refuge would serve as a conservation learning center for the local area. Public access would be improved to Creedman Coulee National Wildlife Refuge.

Upland Habitat and Associated Wildlife

The following upland habitat discussion covers native grassland, disturbed grassland, invasive species, shelterbelts, habitat protection and acquisition, and greater sage-grouse.

Native Grassland. Same as alternative B.

Disturbed Grassland. Same as alternative B.

Invasive and Nonnative Species. Same as alternative B, except through partnerships, the Service would increase the number of acres treated annually with an emphasis on preventing further encroachment of crested wheatgrass and Russian olive into native grassland.

Shelterbelts. Same as alternative B.

Habitat Protection and Acquisition. Same as alternative B.

Greater Sage-Grouse. Same as alternative B.

Wetland Habitat and Associated Wildlife

The following wetland habitat discussion covers managed wetlands, natural wetlands, riparian habitat, water rights, habitat protection and acquisition, wildlife disease, invasive species, and threatened and endangered species.

Managed Wetlands. Same as alternative B, plus the Service would develop additional infrastructure (such as water delivery systems, dikes, and levees to manipulate individual wetlands) to create a more diverse and productive wetland complex. On Bowdoin Refuge, a water delivery canal would be constructed through the Lakeside wetland unit and directly connect to the Dry Lake Canal. This water delivery canal would also include two water structures to manage both halves of the Lakeside unit. This would enable the Service to deliver water to wetlands below the Lakeside unit without having to fill Lakeside first. Biological staff would monitor the level of sedimentation occurring in modified wetlands and plan for its removal to restore the biological integrity of the wetland.

Natural Wetlands. Same as alternative B, plus the biological staff would monitor the level of sedimentation occurring in natural wetlands and plan for its removal to restore the biological integrity of the wetland.

Riparian Habitat. Same as alternative B, except the natural vertical structure in riparian corridors would be restored using native species such as cottonwood, willows, and native shrubs to provide habitat for migratory birds and other native wildlife.

Water Supply and Rights. Same as alternative B.

Habitat Protection and Acquisition. Same as alternative B.

Wildlife Disease. Same as alternative A.

Invasive and Nonnative Species. Same as alternative B.

Threatened and Endangered Species. Same as alternative B.

Visitor Services

The following visitor services discussion covers hunting and trapping, fishing, wildlife observation and photography, environmental education and interpretation, public access, and cultural resources.

Hunting and Trapping. Same as alternative B.

Fishing. Same as alternative B.

Wildlife Observation and Photography. Same as alternative B.

Environmental Education and Interpretation. Same as alternative B, plus the Bowdoin Refuge would serve as a conservation learning center for the

surrounding schools and communities to educate students and public about the values of wildlife and wetland and grassland conservation. Biannual teacher workshops would educate teachers about these same values and instruct them on how to use the refuge as an outdoor classroom. A refuge-specific curriculum would be developed.

Public Access. Same as alternative B, plus the Service would work with private landowners within the Executive boundary of Creedman Coulee National Wildlife Refuge to increase and improve access for wildlife-dependent recreational opportunities at the refuge.

Cultural Resources. Same as alternative B, plus the Service would create an interpretive display at the Bowdoin National Wildlife Refuge office depicting the early history of the refuge complex.

Partnerships

The following partnerships discussion covers partnership development and maintenance and energy development on Service lands.

Partnership Development and Maintenance. Same as alternative B, plus the Service would establish a new partnership with Burlington Northern Santa Fe Railroad to help address litter and limit the spread of invasive plants on Bowdoin Refuge where the railroad passes. Additional partnership with the Malta Irrigation District would focus on removing Russian olive trees along the Dodson South Canal, a major seed source for future infestations of trees on Bowdoin Refuge.

Energy Development on Service Lands. Same as alternative B, except the Service would not acquire easements or fee-title lands on properties where the Service could not acquire the mineral rights or guarantee that future extraction operations would not occur.

Operations

The following operations discussion covers staff, operations, facilities, and signs and boundary designation.

Staff. Same as alternative B.

Operations. Same as alternative B.

Facilities. Same as alternative B.

Signs and Boundary Designation. Same as alternative B, plus the satellite refuges would be posted using the new limited-interest boundary sign proposed for these similar private land refuges in North Dakota.

3.4 Summary of Alternatives and Consequences

Table 5 summarizes all aspects of management of the refuge complex under alternatives A–C, other than for Lake Thibadeau National Wildlife Refuge and the salinity and blowing salts issue at Lake Bowdoin:

- As described in section 3.1 above, Lake Thibadeau Refuge alternative 2 (divestiture) is the proposed action for this refuge. Alternatives A–C below apply to the remaining four refuges and one wetland management district in the refuge complex.
- Salinity alternative 4 is the proposed action for resolution of this issue at Lake Bowdoin (refer to “Chapter 6–Analysis of Salinity”). This salinity and blowing salts alternative supports the actions outlined in alternative B (proposed action) for the entire refuge complex.



Pronghorn graze in the eastern uplands along Lake Bowdoin.

Table 5. Summary of CCP alternatives for Bowdoin National Wildlife Refuge Complex, Montana.

<i>Alternative A (current management—no action)</i>	<i>Alternative B (proposed action)</i>	<i>Alternative C</i>
GOAL for Upland Habitat and Associated Wildlife. Protect, enhance, and restore grassland habitat for breeding and migratory birds and other wildlife while maintaining the biological diversity and integrity of native prairie grasslands.		
Native grassland—actions		
<p>Manipulate native grasslands using various techniques such as burning, spraying, grazing, and resting periods.</p> <p>Base management actions on outside research and do not follow an established management plan.</p> <p>Allow periodic cattle grazing of about 10 percent of the refuge complex uplands with no evaluation of response.</p>	<p>Actively manage native grasslands for targeted grassland birds to mimic the natural processes of burning and grazing (timing and frequency) to enhance native grassland with emphasis on dominant historical communities that still exist in the refuge complex.</p> <p>Prepare a grassland habitat management plan (within the habitat management plan) based on tested methods for preserving and enhancing native grassland.</p>	Same as alternative B.
Native grassland—environmental consequences		
<p>Native grasslands would be maintained at current conditions, providing habitat for many grassland-nesting birds.</p> <p>Native grassland protected through fee title or easement would be protected in perpetuity from development or conversion to agricultural purposes. This would provide expanded grassland habitats for dependent species. Protected grassland would reduce our carbon footprint.</p> <p>Prescribed burning and grazing of native grassland would reduce excess residual plant material and improve seed germination and plant vigor.</p> <p>Continuing to rest the native grasslands would maintain the dominance of clubmoss, prohibiting the regeneration of other native grasses and forbs.</p> <p>A continued lack of on-refuge experimentation, management, planning, and monitoring may result in undesirable habitat modifications and loss of native grasslands.</p>	<p>Same as alternative A, <i>except</i>:</p> <p>Managing for selected bird species may reduce habitat for other nonselected but desirable species.</p> <p>Inventory and monitoring would be limited to targeted species to save time and resources.</p> <p>Native plant species diversity would increase, providing improved habitat for most native grassland-nesting birds and other resident wildlife.</p> <p>Management practices such as grazing may result in invasive plant infestations and trampling that could contribute to nest predation. However, these would be short-term effects offset by the long-term improvements to habitat, which would increase nesting production and success.</p> <p>Using prescribed fire during the nesting season can lead to nest destruction and increased nest predation; however, birds will typically reneest but may produce fewer eggs. In the long-term, production would increase with the improved habitat conditions.</p> <p>Developing a grassland habitat management plan would focus resources and effort on the highest priority habitat needs.</p>	Same as alternative B.

Table 5. Summary of CCP alternatives for Bowdoin National Wildlife Refuge Complex, Montana.

<i>Alternative A (current management—no action)</i>	<i>Alternative B (proposed action)</i>	<i>Alternative C</i>
Disturbed grassland—actions		
<p>Periodically treat disturbed grasslands, also known as DNC, using various techniques such as burning, spraying, grazing, haying, clipping, and resting periods.</p> <p>Restore cropland on waterfowl production areas mainly to native grasses and forbs at a rate of 50 acres per year.</p> <p>Continue to seed DNC on highly erodible lands in the wetland management district. Convert DNC fields on the Bowdoin Refuge to native forbs and grasses.</p>	<p>Gradually convert all disturbed grasslands to native grasses, forbs, and shrubs that have the greatest potential to survive and outcompete invasive species while providing habitat to targeted grassland-dependent birds.</p> <p>Ensure that all invasive species are controlled in restored areas.</p>	Same as alternative B.
Disturbed grassland—environmental consequences		
<p>Disturbed grassland (DNC) provides valuable nesting habitat for grassland birds. With minimal funding, seeding of cropland areas to DNC or replanting DNC is less expensive and easier to establish than native grass.</p> <p>Without rejuvenation (such as reseeding) most of the disturbed grasslands would lose optimal species composition and structure needed for nesting grassland birds.</p> <p>Gradual restoration of croplands to native grasses and forbs would increase plant diversity and grassland bird-nesting habitat.</p> <p>Planting DNC would stabilize erodible soils while providing cover and nesting habitat for some grassland-nesting birds.</p>	<p>Same as alternative A, <i>plus</i>:</p> <p>Habitat would be provided for candidate species and species of management concern. Managing for selected bird species may reduce habitat for other nonselected but desirable species.</p> <p>Converting disturbed grasslands and croplands to native grasses and forbs would provide greater plant species diversity and attract a wider variety of grassland-nesting birds.</p> <p>Native plantings may take longer to become established, resulting in low-quality habitat in the short-term with a greater possibility of infestation by invasive plants.</p> <p>Species of birds that prefer DNC may be impacted.</p>	Same as alternative B.
Invasive and nonnative species—actions		
<p>Use mechanical and chemical methods to control the spread of Russian olive. Focus control in the interior of the management units. Give priority to areas where tree removal results in large contiguous blocks of grassland.</p> <p>Use early detection and rapid response to attack initial infestations of invasive plant and mammal species such as leafy spurge, whitetop, and spotted knapweed.</p> <p>Give little to no attention to larger infestations of invasive species such as crested wheatgrass due to lack of resources and staff.</p>	<p>Same as alternative A, <i>except</i>:</p> <p>Work with the Service's Montana Invasive Species Strike Team and partners to ensure that treated areas are mapped, restored with native plant species, monitored, and re-treated as necessary to prevent reinvasion. Increase treatment of Russian olive by at least 25 additional acres. Give priority to areas where tree and shrub removal would create more contiguous blocks of grassland habitat.</p>	<p>Same as alternative B, <i>except</i>:</p> <p>Through partnerships, increase the number of acres treated annually with an emphasis on preventing further encroachment of crested wheatgrass and Russian olive trees into native grassland.</p>

Table 5. Summary of CCP alternatives for Bowdoin National Wildlife Refuge Complex, Montana.

<i>Alternative A</i> (current management—no action)	<i>Alternative B (proposed action)</i>	<i>Alternative C</i>
Invasive and nonnative species—actions (continued)		
	<p>Through partnerships, develop an education and outreach program that discusses the impacts of Russian olive on native habitat and wildlife and provide information on native tree alternatives to Russian olive trees.</p> <p>Through partnerships, conduct experiments to determine the best methods for reducing crested wheatgrass to restore treated sites to native grasses.</p>	
Invasive and nonnative species—environmental consequences		
<p>Without comprehensive and consistent treatment of rapidly spreading Russian olive trees, they would continue to fragment native grasslands, which would impact grassland-dependent birds. Loss of this habitat would prevent the refuge complex from meeting its purposes. This process has been slow and inefficient due to a lack of staff and funding to address the tremendous expanse and invasion by these trees.</p> <p>Habitat would be protected by controlling or eradicating small infestations of invasive plants and noxious weeds. More widespread infestations such as crested wheatgrass would continue to provide low-quality nesting habitat for native birds and continued spread into native areas would degrade upland-nesting habitat.</p> <p>Russian olive trees would provide food, cover, nesting, and perching sites for some birds and mammals including nest predators (magpies, raccoons, and skunks) and some game birds. Predation of grassland birds and their nests would increase due to habitat fragmentation caused by Russian olive.</p>	<p>Same as alternative A, <i>except</i>:</p> <p>Identifying and mapping invasive species would allow more efficient use of resources through improved awareness, planning, treatment, and monitoring.</p> <p>Restoration and followup treatments would eradicate Russian olive trees from target areas, which would improve and restore upland-nesting habitat while preventing additional invasive plant problems.</p> <p>Large, contiguous blocks of grassland habitat would be restored with the removal of nonnative woody vegetation. These large blocks of unfragmented grassland habitat would provide nesting and cover habitat for a variety of grassland-dependent birds and other native wildlife. Predation of nests and young would be reduced and additional nesting territories would be provided.</p> <p>Species that use Russian olive trees for food and cover would move to other treed areas on the refuge complex or migrate to wooded habitats off the refuge complex.</p> <p>Educating the public about the impacts of Russian olive trees may reduce off-refuge seed sources and increase off-refuge native plantings for the benefit of native wildlife.</p> <p>Experimental treatments of crested wheatgrass would result in an effective, long-term treatment program and restore native grasslands, improving habitat for most grassland-dependent birds.</p>	<p>Same as alternative B, <i>except</i>:</p> <p>Monotypic stands of Russian olive trees and crested wheatgrass infestations would be reduced more quickly while native prairie habitat would be improved and restored. This increased effort would require additional cost and resources and additional monitoring to ensure areas are not reinfested.</p>

Table 5. Summary of CCP alternatives for Bowdoin National Wildlife Refuge Complex, Montana.

<i>Alternative A (current management—no action)</i>	<i>Alternative B (proposed action)</i>	<i>Alternative C</i>
Shelterbelts—actions		
Remove Russian olive trees as the only active management of shelterbelts.	Excluding the office compound, begin removing all shelterbelts to create more contiguous blocks of grassland habitat and restore it to prevent invasive species from encroaching. Permit no additional shelterbelts.	Same as alternative B.
Shelterbelts—environmental consequences		
<p>Shelterbelts would deteriorate while continuing to cause fragmentation of the surrounding grassland and serve as seed sources for invasive trees and shrubs.</p> <p>Shelterbelts would provide marginal habitat to various wildlife species, many undesirable. This includes food, cover, nesting, and perching sites for some birds and mammals including nest predators (magpies, raccoons, and skunks) and some game birds.</p>	<p>Upland-nesting conditions would be immediately improved with restoration and less fragmentation. Grasslands would no longer be fragmented by new plantings of shelterbelts. This would reduce predation and maintain and improve habitats for grassland-nesting birds.</p> <p>Seed sources for invasive plants would be eliminated.</p>	Same as alternative B.
Habitat protection and acquisition—actions		
<p>Continue annual protection and enforcement of current Service grassland easements as first priority.</p> <p>Continue to seek potential grassland easements to acquire from willing sellers as time and staff permits. Give priority for fee-title acquisition to private inholdings adjacent to or within boundaries of the refuges and waterfowl production areas and from willing sellers, as funding and opportunities arise.</p>	<p>Same as alternative A, <i>plus</i>:</p> <p>Prepare grant proposals to pursue resources for future acquisitions of grassland easements and fee title from willing sellers.</p> <p>Work with HAPET to identify critical waterfowl breeding and nesting sites that need protection.</p> <p>Establish partnerships with conservation groups to acquire lands for transfer.</p>	Same as alternative B.
Habitat protection and acquisition—environmental consequences		
<p>Through fee-title and easement acquisitions, more quality habitat would be permanently protected and managed for the benefit of wildlife.</p> <p>Fee-title lands would provide additional public use opportunities.</p> <p>Enforcement of easements and regulations on Service lands with current law enforcement capabilities would continue to be marginal due to the size of the refuge complex, logistics, and travel involved.</p>	<p>Same as alternative A, <i>plus</i>:</p> <p>Grants and partnerships would provide additional resources for acquisitions and more flexibility in working with willing sellers, resulting in more immediate protection of upland habitats.</p> <p>Identification of priority areas for protection would ensure that the most critical waterfowl breeding and nesting habitats are protected as resources and opportunities become available.</p>	Same as alternative B.

Table 5. Summary of CCP alternatives for Bowdoin National Wildlife Refuge Complex, Montana.

<i>Alternative A (current management—no action)</i>	<i>Alternative B (proposed action)</i>	<i>Alternative C</i>
Greater sage-grouse—actions		
<p>Continue to provide habitat for greater sage-grouse.</p>	<p>Same as alternative A, <i>plus</i>:</p> <ul style="list-style-type: none"> Monitor population levels and trends. Identify and maintain or enhance sage-grouse habitat throughout the refuge complex. Target greater sage-grouse for future upland habitat management actions. Plant silver sagebrush on the Korsbeck and Beaver Creek WPAs to provide additional breeding, nesting, and feeding habitat for greater sage-grouse. 	<p>Same as alternative B.</p>
Greater sage-grouse—environmental consequences		
<p>Protecting existing greater sage-grouse habitat would continue to provide protected quality habitat for this resident species, which has been recently designated as a candidate for listing as a threatened species.</p>	<p>Same as alternative A, <i>plus</i>:</p> <ul style="list-style-type: none"> Identifying all potential sage-grouse habitat would allow the Service to better manage, protect, and restore or enhance it. Restoring sagebrush habitat to these waterfowl production areas would provide additional nesting and feeding habitat for greater sage-grouse. 	<p>Same as alternative B.</p>
GOAL for Wetland Habitat and Associated Wildlife. Provide wetland habitat for breeding and migratory birds and other wildlife that maintains biological diversity and integrity of prairie pothole wetlands.		
Managed wetlands—actions		
<p>Flood and draw down wetlands in an attempt to mimic natural wetland hydroperiods to provide migration habitat and breeding and nesting habitat for wetland-dependent migratory birds.</p> <p>Because the Bowdoin Refuge’s wetland program is dependent on the availability of natural runoff, delivered water, and periodic flood events from Beaver Creek, continue to exercise Service water rights throughout the refuge complex, including the Reclamation water right for Bowdoin Refuge provided through a perpetual MOA.</p>	<p>Same as alternative A, <i>except</i>:</p> <ul style="list-style-type: none"> Add more staff and equipment to maintain, repair, and replace all water level management structures. Add biological and maintenance staff to achieve enhancement, restoration, creation, protection, and maintenance of managed wetlands throughout the refuge complex. Acquire funding to buy additional delivered water from the Malta Irrigation District (when available) to properly manage wetlands on Bowdoin Refuge and Pearce WPA, including piping plover nesting habitat. Install new ground water wells to supplement wetland management needs. Add water-pumping sites on the Beaver Creek and McNeil Slough WPAs to create wetland habitat for migratory birds. 	<p>Same as alternative B, <i>plus</i>:</p> <ul style="list-style-type: none"> Construct additional infrastructure such as water delivery systems, dikes, and levees to manipulate individual wetland units to create a more diverse and productive wetland complex. Construct a water delivery canal on Bowdoin Refuge that goes through the Lakeside wetland unit and directly connects to the Dry Lake Canal, enabling the Service to deliver water to wetlands below Lakeside. Monitor the level of sedimentation occurring in managed wetlands and plan for its removal to restore the biological integrity of the wetlands.

Table 5. Summary of CCP alternatives for Bowdoin National Wildlife Refuge Complex, Montana.

<i>Alternative A (current management—no action)</i>	<i>Alternative B (proposed action)</i>	<i>Alternative C</i>
Managed wetlands—actions (continued)		
<p>Continue maintenance of water management structures (such as dikes and levees) as funding became available (most have been repaired and upgraded through annual deferred maintenance funding and partnerships).</p> <p>Identify and map potential wetland creations and enhancement projects.</p> <p>Use prescribed fire, grazing, haying, and other mechanical and chemical treatments to create habitat diversity and provide open-water habitat for migratory waterbirds, primarily waterfowl and shorebirds.</p>	<p>Identify and map potential wetland creations and enhancement projects.</p>	
Managed wetlands—environmental consequences		
<p>Management promotes a diverse wetland complex that helps increase the likelihood of meeting the habitat needs of wetland-dependent species.</p> <p>Typically, there is an inadequate supply of water for Bowdoin Refuge to fill and properly manage these wetlands for wetland-dependent migratory birds. Effective management of managed wetlands within the refuge complex would remain limited by the Service’s water rights and funding.</p> <p>Without adequate monitoring and documentation, it would be difficult to determine if management actions were improving habitat conditions for desired species and whether they should be continued. This could result in loss of desired habitats and wasted resources.</p> <p>Managed wetlands with adequately maintained water control structures would facilitate proper management and control of invasive plants and avian botulism through planned draw-downs.</p> <p>There would always be the potential for an accidental spill of highly saline water into Beaver Creek by natural means (such as a significant rain event) or failure of a water control structure, which could negatively affect downstream habitats and water users.</p>	<p>Same as alternative A, <i>except</i>:</p> <p>More staff and equipment would improve the Service’s ability to maintain, repair, and manage facilities (such as water control structures, levees, and dikes) needed to adequately manage modified wetlands.</p> <p>Mapping would help identify critical habitat areas for migratory birds the Service should be targeting for further wetland creation.</p> <p>With additional biological staff, modified wetlands could be better monitored for effectiveness of management practices, and staff could conduct biological studies to improve management capabilities and wildlife use.</p> <p>With additional staff, herbicide application would be used more effectively to restore wetland habitat. Use of herbicides in wetlands could have potential, short-term, negative effects on aquatic vegetation, invertebrates, and nesting habitat for some bird species.</p> <p>These short-term effects would be offset by the long-term improvements to wetland habitat.</p> <p>Acquiring additional water resources would increase the availability and quality of habitat for wetland-dependent migratory birds, including the threatened piping plover.</p>	<p>Same as alternative B, <i>plus</i>:</p> <p>New infrastructure would facilitate and improve wetland management capabilities of managed wetlands, increasing habitat for migratory wetland birds. This new infrastructure could be expensive to construct initially and would need maintenance.</p> <p>Monitoring sedimentation would determine maintenance needs and ensure the health and survival of created wetlands.</p>

Table 5. Summary of CCP alternatives for Bowdoin National Wildlife Refuge Complex, Montana.

<i>Alternative A</i> (current management—no action)	<i>Alternative B (proposed action)</i>	<i>Alternative C</i>
Managed wetlands—environmental consequences (continued)		
<p>The use of prescribed fire, grazing, haying, and other mechanical and chemical treatments would continue to improve the quality of wetland habitat for migratory birds and other wetland-dependent wildlife.</p> <p>Reduction in the extent of cattails should also improve migratory habitat for ducks and shorebirds as wetlands are flooded during spring and fall migration periods.</p>		
Natural wetlands—actions		
<p>Continue to monitor natural wetlands for invasive plant species and wildlife use.</p> <p>Use management practices such as prescribed burning, grazing, and invasive plant control to maintain the natural productivity of the wetlands to restore habitat for migratory birds.</p> <p>Restore potential wetland restoration sites that have been identified if money became available.</p> <p>With partners, pursue resources to identify and protect critical wetland complexes for breeding and nesting waterfowl through easements or fee-title acquisition.</p>	<p>Same as alternative A, <i>except</i>:</p> <p>Acquire additional money to restore natural wetlands.</p> <p>Use additional biological treatments to treat invasive plants and noxious weeds.</p> <p>Monitor and plan management needs on natural wetlands with additional biological staff.</p>	<p>Same as alternative B, <i>plus</i>:</p> <p>Monitor the level of sedimentation occurring in natural wetlands and plan for its removal to restore the biological integrity of the wetlands.</p>
Natural wetlands—environmental consequences		
<p>The lack of resources and staff to effectively restore, manage, and maximize the potential of natural wetlands results in many missed opportunities to provide important habitat for wetland-dependent wildlife.</p> <p>With current staffing levels, control of invasive plants and cattail in wetlands would continue on a small scale; therefore, some wetland habitat for migratory birds would be improved as noxious weeds and invasive plants were controlled or eradicated.</p> <p>Critical wetland complexes would be protected, expanding available habitat for wetland-dependent wildlife.</p>	<p>Same as alternative A, <i>except</i>:</p> <p>Additional natural wetlands would be restored while current wetlands would be properly managed. This includes the treatment of invasive plants and noxious weeds. Restored natural wetlands would provide quality wetland habitat for wetland-dependent migratory birds and other wildlife.</p>	<p>Same as alternative B, <i>plus</i>:</p> <p>Monitoring sedimentation would determine maintenance needs and ensure the health and survival of natural wetlands.</p>

Table 5. Summary of CCP alternatives for Bowdoin National Wildlife Refuge Complex, Montana.

<i>Alternative A (current management—no action)</i>	<i>Alternative B (proposed action)</i>	<i>Alternative C</i>
Riparian habitat—actions		
<p>Continue to fence the boundaries of the refuges and waterfowl production areas to eliminate the negative effects of trespass livestock grazing.</p> <p>Continue to rest riparian areas, so they can revegetate naturally.</p> <p>Use early detection and rapid response (chemical, biological, and mechanical methods) to treat initial infestations of invasive plant species.</p>	<p>Same as alternative A, <i>plus</i>:</p> <p>The refuge complex would work with the Services Montana strike team and partners to identify and map the locations and extent of invasive species within the riparian areas. Treatments would be documented and sites would be restored with native plant species, and monitored (re-treating as necessary) to prevent reinvasion.</p> <p>Russian olive trees would be removed and these areas would be revegetated with native species, as needed. Treated sites would be monitored and re-treated to prevent reinvasion.</p>	<p>Same as alternative B, <i>plus</i>:</p> <p>Natural vertical structure would be restored in riparian corridors using native species, such as cottonwood trees, willows, and native shrubs, to provide habitat for migratory birds and other native wildlife.</p>
Riparian habitat—environmental consequences		
<p>Excluding cattle from riparian areas should allow for these areas to revegetate naturally with the potential of introducing nonnative or invasive species.</p> <p>Riparian habitat would be protected and improved by controlling or eradicating small infestations of invasive and noxious species including Russian olive.</p>	<p>Same as alternative A, <i>except</i>:</p> <p>Identifying and mapping invasive species would allow more efficient use of resources through improved awareness, planning, treatment, and monitoring.</p> <p>Monitoring of treated areas would help in determining the best method of control and would also remove the seed source for reinvasion.</p> <p>Restoration of native species would provide habitat for riparian-dependent wildlife species. Species that feed and roost on Russian olive trees may relocate to native forested areas on the refuge complex or onto adjacent wooded lands.</p>	<p>Same as alternative B, <i>plus</i>:</p> <p>Native tree plantings would provide vertical structure and additional nesting, roosting, and food sources for native birds and other wildlife. Planting trees would be costly and time-consuming.</p>
Water supply and rights—actions		
<p>Continue to exercise the Service’s current water rights and the use described in the MOA with Reclamation to provide habitat for migratory birds. When additional water is available to meet habitat objectives, continue to pay for additional deliveries of water from the Malta Irrigation District as refuge budgets allow.</p>	<p>Same as alternative A, <i>except</i>:</p> <p>Complete the adjudication of the Federal reserved water rights and compact between the State of Montana and the Service.</p> <p>Acquire funding to purchase additional water deliveries when they are made available to Bowdoin Refuge and Pearce WPA.</p>	<p>Same as alternative B.</p>

Table 5. Summary of CCP alternatives for Bowdoin National Wildlife Refuge Complex, Montana.

<i>Alternative A (current management—no action)</i>	<i>Alternative B (proposed action)</i>	<i>Alternative C</i>
Water supply and rights—environmental consequences		
<p>Water delivery costs continue to rise, yet refuge complex budgets for purchasing delivered water is stagnant, resulting in less wetland habitat available for migratory birds.</p> <p>Current budgets do not permit the Service to buy enough additional irrigation water to adequately manage Bowdoin Refuge and Pearce WPA.</p>	<p>Same as alternative A, <i>except</i>:</p> <p>Additional water resources for Bowdoin Refuge and Pearce WPA would allow the Service to better manage wetland resources, improve water quality, and provide more wetland habitat for migratory birds. Additional water resources would also provide nesting habitat for the threatened piping plover on Piping Plover Pond on Bowdoin Refuge.</p> <p>More money would be needed to consistently pay for additional water deliveries, when available.</p>	Same as alternative B.
Habitat protection and acquisition—actions		
<p>Annually inspect all wetland easements for compliance.</p> <p>Continue to protect natural wetlands through easements and fee-title purchases from willing sellers within the refuge acquisition boundaries and within the wetland management district. Give first priority to the continued annual protection and enforcement of current wetland easements. Give second priority to continue to protect natural wetlands through Service easements from willing sellers. Give third priority to fee-title acquisition from willing sellers.</p>	<p>Same as alternative A, <i>plus</i>:</p> <p>Work with partners and prepare grant proposals to pursue resources for future acquisitions of wetland easements and fee-title from willing sellers.</p> <p>Work with HAPET to identify critical waterfowl breeding and nesting sites that need protection.</p>	Same as alternative B.
Habitat protection and acquisition—environmental consequences		
<p>Additional protected habitats would provide expanded resting and breeding areas for wetland-dependent wildlife.</p>	<p>Same as alternative A, <i>plus</i>:</p> <p>Protection of identified, critical habitat for waterfowl breeding and nesting would be expanded using additional resources. This would provide important habitat for waterfowl and other migratory waterbirds and wetland-dependent wildlife in perpetuity.</p>	Same as alternative B.
Wildlife disease—actions		
<p>Plan water deliveries during early spring (through May 15) and late summer (early September) to avoid rising or fluctuating water levels on areas susceptible to avian botulism outbreaks.</p> <p>As temperatures rise in summer, monitor wetlands weekly for disease outbreaks. Send sample carcasses to the National Wildlife Health Center for analysis.</p>	Same as alternative A.	Same as alternative A.

Table 5. Summary of CCP alternatives for Bowdoin National Wildlife Refuge Complex, Montana.

<i>Alternative A (current management—no action)</i>	<i>Alternative B (proposed action)</i>	<i>Alternative C</i>
Wildlife disease—actions (continued)		
<p>Collect dead birds only if a disease outbreak posed a human health risk (the larger botulism outbreaks cannot be prevented by human intervention) or in high public use areas as determined by the Service.</p> <p>Continue to allow the U.S. Inter-agency Working Group to monitor the refuge complex for any avian influenza outbreaks.</p> <p>When approved, implement the Mountain–Prairie Region policy for a mosquito control plan to address potential outbreaks of West Nile virus and avian influenza.</p>		
Wildlife disease—environmental consequences		
<p>Water level management would lessen the chances of an outbreak of avian botulism but not completely eliminate it. Larger avian botulism outbreaks would be permitted to run their course, since recent studies indicate retrieving dead birds does little to reduce the effects of the disease. This may require the refuge to notify and educate the public about this natural process.</p> <p>Monitoring for diseases that may be transferred to humans, could limit their spread.</p>	Same as alternative A.	Same as alternative A.
Invasive and nonnative species—actions		
<p>Use early detection and rapid response to treat initial infestations of invasive plant and mammal species.</p> <p>Use chemical and mechanical treatments such as prescribed fire, haying, and grazing to periodically set back invasive plants and noxious weeds as necessary to restore habitat for targeted resident and migratory birds.</p>	<p>Same as alternative A, <i>plus</i>:</p> <p>Work with the Service’s Montana Invasive Species Strike Team and partners to identify and map the locations and extent of invasive species in wetlands.</p> <p>For treated areas, map, monitor, and re-treat as necessary to prevent reinvasion. Investigate the availability and effectiveness of biological treatments.</p> <p>Remove Russian olive trees and other vegetation that impedes the function of water level management structures (such as dikes, ditches, and levees).</p>	Same as alternative B.

Table 5. Summary of CCP alternatives for Bowdoin National Wildlife Refuge Complex, Montana.

<i>Alternative A (current management—no action)</i>	<i>Alternative B (proposed action)</i>	<i>Alternative C</i>
Invasive and nonnative species—environmental consequences		
<p>Early detection and rapid response would facilitate control and possible eradication of small infestations of new invaders around wetlands and protect the integrity and manageability of dikes and water delivery systems.</p> <p>Mechanical and chemical treatment of invasive plants and noxious weeds would create open-water habitat for targeted resident and migratory birds, promote native vegetation, and improve recreational opportunities.</p>	<p>Same as alternative A, <i>plus</i>:</p> <p>Identifying and mapping invasive species would allow more efficient treatment and use of resources through improved awareness, planning, treatment, and monitoring. This awareness would help the refuge complex in working with the surrounding counties to identify seed sources and prioritize treatment sites.</p> <p>Water level management capabilities, thus habitat, would be improved on areas where Russian olive trees are removed from water level management structures.</p> <p>Wildlife using existing Russian olive trees would resort to using native cover and food sources found on the refuge complex or would use neighboring lands.</p>	Same as alternative B.
Threatened and endangered species—actions		
<p>Take no action to acquire water adequate water to properly manage critical habitat for piping plovers on Bowdoin Refuge to attract nesting birds.</p>	<p>Acquire additional water resources (see “Water Supply and Rights” above) to properly manage piping plover habitat on Bowdoin National Wildlife Refuge and monitor response. Create additional piping plover habitat as additional water is acquired.</p> <p>Protect all nests from flooding and predation. Monitor hatched young until they fledge.</p>	Same as alternative B.
Threatened and endangered species—environmental consequences		
<p>Lack of adequate water supply on Bowdoin National Wildlife Refuge would continue the lack of adequate habitat for the threatened piping plover. The plovers have moved to other, less protected areas, which may affect their survival and nesting success.</p>	<p>Additional water would permit the Bowdoin Refuge to manage wetlands specifically to attract piping plovers. This would give the plover added protection not currently found on off-refuge nesting sites.</p> <p>Artificially protecting nests and young would increase survival of eggs and nestlings but may result in abandonment.</p>	Same as alternative B.

Table 5. Summary of CCP alternatives for Bowdoin National Wildlife Refuge Complex, Montana.

<i>Alternative A (current management—no action)</i>	<i>Alternative B (proposed action)</i>	<i>Alternative C</i>
GOAL for Visitor Services. Provide visitors of all abilities with wildlife-dependent recreation, interpretation, and education opportunities that fosters an appreciation and understanding of the unique wildlife, plant communities, and cultural resources of the Montana Prairie Pothole Region.		
Hunting and trapping—actions		
<p>Continue to allow current hunting of upland birds and waterfowl in select areas on the refuges to manage wildlife and provide compatible, priority, wildlife-dependent public use.</p> <p>Permit late-season hunting of upland game birds on previously closed areas at Bowdoin Refuge after waterfowl have left (first 2 days are for young hunters only) but no sooner than December 1.</p> <p>Continue current compatible hunting program on waterfowl production areas.</p> <p>Retain the accessible boat dock (Lake Bowdoin), parking, and hunting blind (Pearce WPA).</p> <p>Require all hunters on Bowdoin Refuge to sign in and out at the informational kiosk, where refuge hunting regulations and maps are provided.</p> <p>Continue to issue special use permits to a limited number of trappers on Bowdoin Refuge to remove burrowing animals that threaten refuge infrastructure or to protect migratory birds. Continue to prohibit leg-hold traps.</p> <p>Continue to permit trapping on the waterfowl production areas according to State and Federal regulations.</p>	<p>Same as alternative A, <i>plus</i>:</p> <p>Work with the State to determine the feasibility of providing an accessible, limited, big game archery hunt on portions of Bowdoin Refuge currently open to public use. Address the safety of refuge visitors and the wildlife and habitat response.</p>	<p>Same as alternative B.</p>
Hunting and trapping—environmental consequences		
<p>Hunter numbers and satisfaction would remain relatively unchanged.</p> <p>Roads, trails, and water management structures on Bowdoin Refuge would continue to be protected from burrowing animals.</p> <p>The success of grassland- and wetland-nesting birds would increase due to a reduction in mammalian predators such as skunks and raccoons.</p>	<p>Same as alternative A, <i>plus</i>:</p> <p>The Service and the State would be able to collect the necessary information and evaluate all the options needed to determine if and how a safe big game archery hunt could be found compatible on Bowdoin Refuge in the future.</p>	<p>Same as alternative A.</p>
Fishing—actions		
<p>Continue compatible, recreational fishing opportunities on waterfowl production areas with suitable fishing habitat (currently, two of the seven waterfowl production areas).</p>	<p>Same as alternative A.</p>	<p>Same as alternative A.</p>

Table 5. Summary of CCP alternatives for Bowdoin National Wildlife Refuge Complex, Montana.

<i>Alternative A</i> (current management—no action)	<i>Alternative B (proposed action)</i>	<i>Alternative C</i>
Fishing—actions (continued)		
Continue to not permit recreational fishing on any of the refuges, including Bowdoin, which have minimal habitat or high salinity levels, or both, and do not support a game fishery.		
Fishing—environmental consequences		
Fishing opportunities and angler satisfaction would remain relatively unchanged.	Same as alternative A.	Same as alternative A.
Wildlife observation and photography—actions		
<p>Retain the 15-mile auto tour route and an accompanying interpretive brochure for Bowdoin Refuge.</p> <p>Retain two accessible photo blinds, one on Bowdoin Refuge and one on Pearce WPA.</p> <p>Retain the paved 0.4-mile accessible trail around the Display Pond on Bowdoin Refuge including interpretive panels and an observation deck.</p>	<p>Same as alternative A, <i>plus</i>:</p> <p>Provide, at least monthly, wildlife observation and photography programs for refuge complex visitors.</p> <p>Develop stop number 5 along the auto tour route to accommodate more accessible parking and install interpretive kiosks and two spotting scopes for observing wildlife.</p>	Same as alternative B.
Wildlife observation and photography—environmental consequences		
<p>Wildlife observation and photography opportunities would remain constant.</p> <p>Maintaining the 15-mile auto tour route would continue to provide visitors of all abilities with quality wildlife observation and photography opportunities.</p>	<p>Same as alternative A, <i>plus</i>:</p> <p>Wildlife observation and photography opportunities would be expanded and enhanced, creating a greater understanding and appreciation of the refuge complex resources.</p> <p>Enhanced and expanded wildlife-viewing opportunities may cause additional disturbance to wildlife and increase conflicts with other users. Uses would need to be monitored and evaluated to minimize and mitigate any adverse effects.</p>	Same as alternative B.
Environmental education and interpretation—actions		
<p>Continue opportunistic environmental education programs as time and staff allow.</p> <p>Retain the up-to-date interpretive panels and brochures, and update others as resources become available.</p> <p>Create a public use regulation brochure for the satellite refuges and waterfowl production areas.</p> <p>Maintain the refuge complex's Web site to provide information on the resources of the area and public use opportunities.</p>	<p>Same as alternative A, <i>except</i>:</p> <p>Expand opportunities for environmental education and interpretation to foster appreciation and understanding of the Refuge System and the resources of the refuge complex.</p> <p>Update the refuge complex's mammal, reptile, and amphibian lists; develop a wildlife list to the Service's graphic standards.</p> <p>Develop a Friends group for the refuge complex that could work with visitors and students.</p>	<p>Same as alternative B, <i>plus</i>:</p> <p>Serve as a conservation learning center for the surrounding schools and communities to educate students and adults about the values of wildlife, wetland, and grassland conservation.</p> <p>Develop a refuge-specific curriculum with help from local teachers.</p> <p>Conduct biannual workshops for grade school and university teachers.</p>

Table 5. Summary of CCP alternatives for Bowdoin National Wildlife Refuge Complex, Montana.

<i>Alternative A (current management—no action)</i>	<i>Alternative B (proposed action)</i>	<i>Alternative C</i>
Environmental education and interpretation—actions (continued)		
<p>Prepare periodic news articles on refuge complex activities and values of local natural resources.</p> <p>Provide monthly updates to the local chamber of commerce on public use opportunities.</p>	<p>Work with the city of Malta to install an informational kiosk providing refuge complex information and directional maps.</p> <p>Develop a display at the Phillips County museum highlighting the history of the refuge complex.</p>	
Environmental education and interpretation—environmental consequences		
<p>Environmental education would minimally meet the public demand. Opportunities to educate students and the public about the values and purposes of the refuge complex and the Refuge System would be lost. This lack of understanding and appreciation would result in a loss of support for the refuge complex and the Refuge System.</p> <p>Public outreach and interpretation would meet minimum Service requirements. Visitors would be provided adequate resources to independently learn about the refuge complex environment; however, there would be minimal contact with refuge complex staff to answer questions and offer further interpretation.</p>	<p>There would be greater public understanding and appreciation of the refuge complex's resources and issues due to expanded interpretive, outreach, and educational programs.</p> <p>A Friends group could provide additional staff and resources to conduct refuge and visitor services programs, which would increase awareness about the refuge complex and its resources.</p> <p>Visitation by the public, schools, and other groups would increase, providing opportunities to reach a broader audience.</p> <p>If not managed properly, increased use may lead to additional disturbance to wildlife and habitat.</p>	<p>Same as alternative B, <i>plus</i>:</p> <p>Increased use of the refuge as an outdoor classroom by schools and other organizations would result in a greater awareness and appreciation for preserving the area's natural resources.</p> <p>By educating teachers, a greater number of students would receive this environmental education.</p>
Public access—actions		
<p>Continue to provide adequate public access for visitors to participate in compatible, wildlife-dependent public uses.</p> <p>Excluding the office compound, keep the refuge complex open to foot traffic year-round.</p>	<p>Same as alternative A, <i>except</i>:</p> <p>Close the east end of Bowdoin Refuge to all foot traffic at the start of the waterfowl hunting season (through November 30) to provide sanctuary areas for migratory waterfowl and shorebirds. Keep the auto tour route open but require visitors to remain in their vehicles in designated sanctuary areas.</p> <p>Construct a road and parking area on Black Coulee Refuge to improve access to waterfowl hunting opportunities.</p> <p>Work with Phillips County to determine the feasibility of rehabilitating the remaining portion of old U.S. Highway 2 that runs through the north end of Bowdoin Refuge.</p>	<p>Same as alternative B, <i>plus</i>:</p> <p>Work with the landowners on Creedman Coulee Refuge to determine their interest in providing additional access and opportunities for compatible, wildlife-dependent public uses.</p>

Table 5. Summary of CCP alternatives for Bowdoin National Wildlife Refuge Complex, Montana.

<i>Alternative A (current management—no action)</i>	<i>Alternative B (proposed action)</i>	<i>Alternative C</i>
Public access—environmental consequences		
<p>Public access to the refuge complex would remain constant, allowing visitors to access public lands. There would continue to be some disturbance to waterfowl residing on the refuge during periods of higher visitation.</p>	<p>Same as alternative A, <i>except</i>:</p> <p>Sanctuary would be provided for migrating waterfowl and other waterbirds during the waterfowl-hunting season at Bowdoin Refuge.</p> <p>Conflicts between hunters and nonhunters may increase during the hunting season due to closure of the eastern portion of Bowdoin Refuge to foot traffic.</p> <p>Nonhunter satisfaction may decrease due to a reduction in access opportunities. Hunter satisfaction may decrease due to an increase in wildlife disturbance within the hunting zone. However, hunters may have more opportunities to hunt waterfowl, because this sanctuary area may encourage birds to remain on the refuge, including the areas open to hunting.</p> <p>Public use opportunities and satisfaction would increase on Black Coulee Refuge with improved access to the reservoir. Maintenance needs would increase. If the county was able to rehabilitate the remaining portion of U.S. Highway 2, the road would be safer and provide better public access to the refuge.</p> <p>Increased traffic on the road could lead to more littering, and increased driving speeds could lead to more vehicle-wildlife collisions.</p>	<p>Same as alternative B, <i>plus</i>:</p> <p>With improved access through landowner cooperation, public use opportunities and visitor satisfaction may increase on Creedman Coulee Refuge.</p>
Cultural resources—actions		
<p>Use the Montana statewide cultural resource inventory list to determine sensitive sites before activities.</p> <p>Document cultural resource sites and ensure their protection.</p>	<p>Working with the zone archeologist, contractors, local tribes, the State Historic Preservation Office, universities, and other partners, start a comprehensive cultural resource inventory.</p>	<p>Same as alternative B, <i>plus</i>:</p> <p>Create a display at the office interpreting the early history of the refuge complex.</p>
Cultural resources—environmental consequences		
<p>Inventory of the refuge complex's cultural resources would continue at a minimal level. This lack of knowledge would make it more difficult to adequately protect cultural resource sites from theft and vandalism.</p>	<p>Knowledge of the early history of the refuge complex would increase.</p> <p>Increased awareness and mapping of cultural resources would enhance protection of these resources from Service and public activities.</p> <p>More information would help to interpret the unique cultural history of the area.</p>	<p>Same as alternative B, <i>plus</i>:</p> <p>Public knowledge and appreciation for the early history of the refuge complex would increase.</p>

Table 5. Summary of CCP alternatives for Bowdoin National Wildlife Refuge Complex, Montana.

<i>Alternative A (current management—no action)</i>	<i>Alternative B (proposed action)</i>	<i>Alternative C</i>
GOAL for Partnerships. Maintain and expand partnerships that preserve, restore, and enhance healthy and productive prairie/wetland complexes on Bowdoin National Wildlife Refuge and within the wetland management district.		
Partnership development and maintenance—actions		
<p>Pursue partnership opportunities to achieve activities of mutual interest.</p> <p>Continue working with Montana Department of Fish, Wildlife, and Parks to conduct habitat improvement projects in areas open to hunting.</p> <p>Continue to support the private land work of the Partners for Fish and Wildlife Program.</p> <p>Periodically provide easement landowners with information about additional opportunities for compensated added protections. Also, send information about the conservation easement program to other potential landowners.</p>	<p>Same as alternative A, <i>plus</i>:</p> <p>Expand efforts to develop, coordinate, and manage new partnerships to benefit the refuge complex.</p> <p>Work with landowners within the approved boundaries of Hewitt Lake, Black Coulee, and Creedman Coulee refuges to provide willing landowners with opportunities to receive compensation for added protections (grassland and wetland easements and fee title).</p> <p>Continue expanding partnerships with the four counties surrounding the refuge complex to improve roads that provide public access.</p> <p>Work with other Federal land managers to determine if their infrastructure and management actions could be used to enhance the refuge complex’s wetland system.</p> <p>Develop a Friends Group for the refuge complex.</p>	<p>Same as alternative B, <i>plus</i>:</p> <p>Pursue a partnership with the Burlington Northern Railroad Company to address litter and invasive species issues related to their railroad right-of-way.</p> <p>Develop a partnership with the Malta Irrigation District to control Russian olive trees along the Dodson South Canal.</p>
Partnership development and maintenance—environmental consequences		
<p>Expanded partnerships would increase the Service’s ability to provide quality habitats for wildlife.</p> <p>Continued support of the Partners for Fish and Wildlife Program would improve relationships between the Government and landowners while protecting additional habitat on private lands, some that have the potential to affect refuge complex lands and waters.</p> <p>Periodic easement landowner contacts would reduce the potential for easement contract violations.</p> <p>There may be additional opportunities to acquire easements on private lands that have high wetland densities and large tracts of native prairie.</p>	<p>Same as alternative A, <i>plus</i>:</p> <p>Expanded partnerships would provide additional resources to address management issues of common interest while reducing potential impacts from offsite activities on neighboring lands.</p> <p>Hewitt Lake, Black Coulee, and Creedman Coulee refuges would provide additional upland habitat for migratory birds.</p> <p>Improving county road surfaces would provide a better experience for wildlife-dependent recreationists. Increased traffic through the refuge complex may result in higher human to wildlife interactions.</p>	<p>Same as alternative B, <i>plus</i>:</p> <p>A partnership between Bowdoin Refuge and the railroad would provide for a cleaner landscape and a quality experience for visitors. Invasive species brought into the refuge via the railroad right-of-way would be controlled and monitored.</p> <p>Removal of Russian Olive trees on the Dodson South Canal would eliminate a major seed source for invasion of Russian Olive trees on Bowdoin Refuge.</p>
Energy development on Service lands—actions		
<p>Following Service procedures, work with energy developers who are extracting reserved and excepted oil, gas, and mineral rights on grassland easements and fee-title lands to minimize impacts from their operations.</p>	<p>Same as alternative A, <i>except</i>:</p> <p>Evaluate all future, land acquisition projects to determine the status of the reserved and excepted oil, gas, and mineral rights to evaluate the potential impacts of energy development on wetland and grassland habitats.</p>	<p>Same as alternative B, <i>except</i>:</p> <p>Do not buy easements or fee-title lands on properties where the Service cannot acquire the mineral rights or guarantee that future extraction operations would not occur.</p>

Table 5. Summary of CCP alternatives for Bowdoin National Wildlife Refuge Complex, Montana.

<i>Alternative A (current management—no action)</i>	<i>Alternative B (proposed action)</i>	<i>Alternative C</i>
Energy development on Service lands—actions (continued)		
<p>Keep physical occupancy at the minimum space compatible with efficient mineral operation.</p> <p>Work with energy developers who hold mineral leases on Service lands to complete habitat improvement projects in exchange for disturbances caused by their exploration and development activities.</p> <p>Manage impacts using the FWS Oil and Gas handbook and 50 CFR.</p>	<p>When the policy on energy development on Service lands is completed, modify the program to support the direction and objectives of this new policy.</p>	
Energy development on Service lands—environmental consequences		
<p>Partnerships with energy developers would encourage good stewardship. This may help to minimize impacts while preserving the maximum amount of wetland and grassland habitats.</p> <p>Energy development would be conducted with minimal interference to the operation of the refuge complex. Impacts to wildlife and habitat would increase as energy demand increases.</p>	<p>Same as alternative A, <i>plus</i>:</p> <p>The Service would be able to better determine potential impacts of energy development on lands proposed for protection. This evaluation would help the Service in making decisions that are more informed and in setting priorities for proposals.</p>	<p>Impacts to future easements caused by oil and gas development may be lessened, but landowners may be discouraged from entering into any agreements with the Service, thus limiting the quantity and quality of lands available for easement.</p>
GOAL for Operations. Prioritize for wildlife first and emphasize the protection of trust resources in the utilization of staff, funding, partnerships, and volunteer programs.		
Staff—actions		
<p>Retain the current staff of five full-time equivalent employees (refuge manager, GS-485-12; wildlife biologist, GS-486-11; wildlife refuge specialist (collateral law enforcement officer), GS-485-9; administrative assistant, GS-303-7; and maintenance worker, WG-4749-8).</p> <p>To ensure the success of refuge complex programs, recruit one seasonal maintenance worker, two seasonal biological technicians, and volunteers, as funding is available.</p> <p>Retain the biologist for the Partners for Fish and Wildlife Program to be stationed at the refuge complex.</p>	<p>Same as alternative A, <i>plus</i>:</p> <p>Increase the staff by six and one-half new positions including a GS-13 refuge manager position. Convert the current manager position to a supervisory wildlife refuge specialist to serve as deputy refuge manager.</p> <p>Recruit a GS-326-5 office automation clerk and upgrade the administrative support assistant to an administrative officer, GS-341-9. Recruit an additional WG-4749-8 maintenance worker and a career-seasonal WG-3502-5 laborer.</p> <p>Recruit a GS-025-9 visitor services specialist and a GS-025-9 law enforcement officer.</p> <p>Upgrade the wildlife biologist to a GS-486-12. Recruit a permanent, full-time GS-404-8, biological science technician. Annually recruit at least four temporary biological technicians, GS-404-3/4/5.</p>	<p>Same as alternative B.</p>

Table 5. Summary of CCP alternatives for Bowdoin National Wildlife Refuge Complex, Montana.

<i>Alternative A (current management—no action)</i>	<i>Alternative B (proposed action)</i>	<i>Alternative C</i>
Staff—actions (continued)		
	<p>Recruit volunteers from around the country and through State and regional universities and colleges. Reinststate the Youth Conservation Corps program, hiring four youths and one social services aid, GS-186-05, to lead the program.</p> <p>Work with Montana universities to develop a volunteer program by providing college credits in exchange for volunteer work experience.</p>	
Staff—environmental consequences		
<p>Programs would be maintained at the current levels, which means that habitats would continue to degrade due to a significant lack of resources. There would continue to be minimal monitoring of habitat and wildlife responses to management actions.</p> <p>A backlog of maintenance projects would continue to accumulate.</p> <p>As public use continued to increase, it would become more challenging for a single collateral-duty, law enforcement officer to enforce regulations and protect resources.</p>	<p>Same as alternative A, <i>plus</i>:</p> <p>Additional funding would be required for the salary, equipment, facilities, and office space for the additional positions.</p> <p>Additional staff and volunteers would be able to adequately manage and protect the refuge complex habitats and provide visitors with additional quality wildlife-dependent programs and recreational opportunities.</p> <p>Research and monitoring could be conducted and would be used to evaluate management actions and adapt programs.</p> <p>Facilities and equipment would be maintained and maintenance issues would be resolved.</p>	<p>Same as alternative B.</p>
Operations—actions		
<p>Continue funding for operations at current levels.</p> <p>Continue to maintain vehicles, heavy equipment, other equipment, buildings and refuge housing, and other refuge complex facilities and infrastructure needed to achieve management goals.</p> <p>Replace equipment as funding became available.</p>	<p>Same as alternative A, <i>except</i>:</p> <p>Acquire additional resources to achieve refuge and district purposes and achieve the goals, objectives, and strategies identified the draft CCP.</p> <p>Acquire five additional field vehicles and field equipment for additional staff.</p> <p>Replace outdated heavy equipment such as the road grader, scrapper, farm tractor, and front-end loader. Acquire attachments (such as a farm disc, grapple fork, and mowers) for the farm tractor for habitat management purposes. Acquire a mower and marsh master to manage vegetation in wet areas for control of undesirable plant species and to create open-water habitat.</p>	<p>Same as alternative B.</p>

Table 5. Summary of CCP alternatives for Bowdoin National Wildlife Refuge Complex, Montana.

<i>Alternative A</i> (current management—no action)	<i>Alternative B (proposed action)</i>	<i>Alternative C</i>
Operations—environmental consequences		
<p>Current levels of funding are inadequate to acquire the needed staff, facilities, equipment, and other resources necessary to properly manage and protect refuge complex resources, maintain facilities and equipment, and provide quality visitor services programs across a four-county area. This would continue to result in habitat being degraded and a growing backlog of maintenance projects.</p>	<p>Added funding and equipment would ensure enhancement and protection of refuge complex resources and facilities while improving safety and expanding opportunities for visitors to participate in wildlife-dependent uses. A significant increase in annual funding for staff, equipment, and supplies would be necessary to carry out this alternative.</p>	<p>Same as alternative B.</p>
Facilities—actions		
<p>Construct no additional facilities or infrastructure unless funding became available.</p> <p>Due to limited storage facilities, continue to store vehicles outside year-round.</p>	<p>Expand or enhance facilities to accommodate six and one-half additional staff, expanded visitor services programs, and new equipment.</p> <p>Construct a 10-bay storage facility for existing vehicles plus five additional field vehicles for new staff. Construct a four-bay cold storage building to house additional heavy equipment.</p> <p>Expand the visitor contact area and improve the interpretive displays and materials.</p> <p>Construct a separate ground water well for the two refuge complex residences. Expand the bunkhouse to accommodate up to eight people. Convert the Bowdoin Refuge headquarters, apartment, two houses, and shop buildings to a solar power system.</p> <p>Develop one camping site with a concrete pad, septic and water systems, and electricity for a volunteer with a recreational vehicle.</p>	<p>Same as alternative B.</p>
Facilities—environmental consequences		
<p>Current office space is sufficient for current, permanent staff only but would not accommodate any new or seasonal staff or volunteers. The visitor contact area is small and does not allow for interpretive materials such as displays and educational materials, resulting in lost opportunities to educate and interact with visitors.</p> <p>Insufficient seasonal housing makes it difficult to recruit the seasonal staff and volunteers needed to conduct refuge programs.</p>	<p>Equipment would be protected from environmental damage, reducing maintenance costs.</p> <p>Visitors would feel more welcome in an expanded visitor contact area and have new opportunities to learn about the refuge complex's resources through interpretation.</p> <p>Additional office and living space for seasonal staff and volunteers would accommodate the additional staff needed to properly manage and protect the refuge complex resources while providing visitors quality, safe, wildlife-dependent recreation and programs.</p>	<p>Same as alternative B.</p>

Table 5. Summary of CCP alternatives for Bowdoin National Wildlife Refuge Complex, Montana.

<i>Alternative A (current management—no action)</i>	<i>Alternative B (proposed action)</i>	<i>Alternative C</i>
Facilities—environmental consequences (continued)		
<p>Facilities to house vehicles and heavy equipment are inadequate and all heavy equipment and many vehicles are stored outside. Continual exposure to the elements may cause them to deteriorate more rapidly due to ultraviolet light and extreme weather patterns of heat, cold, and wind. Vehicles, boats, and other equipment not stored in secure buildings would be susceptible to theft and vandalism.</p>	<p>The refuge complex would reduce its carbon footprint by using renewable energy and green technologies.</p>	
Signs and boundary designation—actions		
<p>Retain the proper boundary signs and fences to prevent trespass livestock grazing.</p> <p>Continue discussions with a landowner on Hewitt Lake Refuge to exchange fee-title lands needed to create a more manageable and enforceable boundary and bring awareness of the refuge boundary.</p> <p>Retain entrance signs at refuges that have more than 40 percent of lands within their boundaries in fee title.</p> <p>Retain entrance signs at all of the waterfowl production areas.</p>	<p>Same as alternative A, <i>plus</i>: Acquire funding to replace dilapidated boundary fences, gates, and parking areas. Evaluate the need for existing fences for managing a prescriptive grazing program; systematically replace retained fences using wildlife-friendly materials and techniques.</p>	<p>Same as alternative B, <i>plus</i>: Post the portions of the satellite refuges that are privately owned with the new boundary signs proposed for similar limited-interest refuges in North Dakota.</p>
Signs and boundary designation—environmental consequences		
<p>Refuge visitors and neighbors would remain aware of the refuge locations, boundaries, and permitted activities.</p> <p>Exchanging lands on Hewitt Lake Refuge would make enforcement of the refuge boundary more manageable and less confusing for visitors.</p>	<p>Same as alternative A, <i>plus</i>: Wildlife losses from fences would be reduced and wildlife would be able to migrate more freely through the refuge complex.</p>	<p>Same as alternative B, <i>plus</i>: A unique boundary sign would reduce confusion over ownership and the permitted uses on these privately owned refuge areas.</p>
Socioeconomics—environmental consequences		
<p>There would not be any notable changes in the net economic contribution of the refuge complex to the local economy through visitor spending or employee earnings.</p>	<p>There would be a significant increase in the net economic contribution of the refuge complex to the local economy (an increase of \$457,500 over current levels) through visitor spending and employee earnings.</p>	<p>Same as alternative B, <i>except</i>: There would be a slightly more significant increase in visitor spending in the area (an increase of \$487,500 over current levels) generated by increased visitation as a result of enhanced outreach efforts, programming, and public access.</p>

