

Chapter 3—Alternatives



Lori Iverson / FWS

The National Elk Refuge is a good place to watch predators in action, mountain lions and coyotes are just two of them.

The purpose of this chapter is to describe the management alternatives considered for the National Elk Refuge. Alternatives are different approaches to management that are designed to achieve the refuge purposes, vision, and goals; the mission of the Refuge System; and the mission of the U.S. Fish and Wildlife Service. We develop alternatives to address the key issues, concerns, and problems identified by during public scoping and throughout the development of the draft CCP.

3.1 Alternatives Development

We developed four alternatives that represent different approaches for permanent protection and res-

toration of fish, wildlife, plants, habitats, and other resources. We 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.

We evaluated each alternative according to how well it would advance the vision and goals of the refuge and the Refuge System and how it would address the planning issues. Table 4 in section 3.9 at the end of this chapter summarizes the alternatives' actions and associated consequences. Details about the consequences are in "Chapter 5—Environmental Consequences."

3.2 Alternatives Considered but Eliminated from Detailed Study

There were no alternatives considered but eliminated from detailed study.

3.3 Elements Common to All Alternatives

There are some consistencies among the four alternatives. This section identifies the following key elements that will be included regardless of the alternative chosen for the final CCP.

- We will work to lower the risk of brucellosis transmission to livestock by concentrating elk and bison on the refuge and keeping them separated from livestock during the critical period of potential transmission (February–March).
- We will conduct winter feeding activities in ways that may reduce brucellosis transmission within the elk and bison herds.
- We will continue our herd-health monitoring program.
- We will inform the public about the disease status of elk and bison on the refuge and recommended handling practices.
- We will cooperate with WGFD on a monitoring program for chronic wasting disease.
- We will develop a contingency plan for chronic wasting disease.
- We will immediately euthanize and remove animals with suspected chronic wasting disease.

Laws and Regulations

We will make sure that management of the refuge complies with all Federal laws and regulations that provide direction for managing units of the Refuge System.

Invasive Species

We will work to control invasive species through an integrated pest management approach that includes biological, cultural, chemical, and mechanical treatment methods. The extent and type of treatment varies by alternative.

Bison and Elk Management Plan

We will carry out the goals, objectives, and strategies in the “Management Direction” chapter of the Bison and Elk Management Plan that are specific to the National Elk Refuge.

For the cultivated, irrigated fields on the refuge, we will manage to meet the objectives in the Bison and Elk Management Plan for elk and bison grazing (pages 130–33).

In addition, the following elk and bison management actions were covered and analyzed in the Bison and Elk Management Plan (page 13):

Wildlife Disease

There will be surveillance, as needed, for key wildlife diseases such as botulism and West Nile virus. The specific management actions vary by alternative.

Access for Boating

Boating would be prohibited on all refuge waters. Because of the potential wildlife and habitat effects and our compliance with the Snake River Headwaters Comprehensive River Management Plan, we would continue to prohibit hand-propelled boating along the Gros Ventre River, Flat Creek, and ponds. Motorized boating would be prohibited because of the small size and shallow nature of refuge waterbodies.

Research

We will conduct research efforts internally (with in-house staff) or generate external research (such as

through universities) to help us meet the management objectives. The focus of research varies by alternative.

Refuge Uses

We will continue to prohibit the following public uses on the refuge because they are not compatible uses: weddings, antler collecting, geocaching, boating, and swimming.

We will continue to prohibit pets and horses on the North Highway 89 Pathway.

Landowner Coordination

Our actions will not adversely affect any adjacent landowners without a mutual agreement and adequate compensation.

Partnerships

We will promote strong and diverse partnerships to help us meet objectives and achieve the refuge goals. The focus and type of partnerships varies by alternative

3.4 Description of Alternatives

We considered four alternatives to achieve the proposed vision and goals and to address the issues:

- Alternative A, the no-action alternative, describes the current, ongoing management activities throughout the refuge. This alternative may not be able to meet all the CCP goals, but it is provided as a basis for comparison with the other alternatives.
- Alternative B is a balance of public use with intensive resource management.
- Alternative C has an emphasis on intact ecosystems and promoting natural processes.
- Alternative D, our proposed action, promotes natural habitats and enhances public

use. This alternative reflects the draft CCP and is further described in chapter 6.

The following sections 3.5–3.8 describe each alternative’s focus and provide details about how the alternatives would meet the refuge goals:

3.5 Alternative A (Current Management)—No Action

This is the no-action alternative, which represents the current management of the refuge. 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.

Our management activity would remain the same. The Jackson elk and bison herds and their habitat are adaptively managed with an emphasis on improving winter and transitional range on refuge lands, while at the same time ensuring that the biotic integrity and environmental health of the resources are sustained over the long term. A dynamic framework for decreasing the need for supplemental feeding on the refuge is developed and carried out in close coordination with WGFD and is based on existing conditions, trends, new research findings, and other changing circumstances. Population management, vegetation restoration, ongoing monitoring, and public education are integral parts of this framework.

We would not develop any new management, restoration, or visitor services programs at the refuge. Current habitat and wildlife practices benefitting elk, bison, migratory birds, and other wildlife would not be expanded or changed. Staff would continue monitoring, inventory, and research activities at their current level. Funding and staff levels would remain the same with little change in overall trends. Programs would follow the same direction, emphasis, and intensity as they do now.

Climate Change

The refuge would continue baseline monitoring of habitat conditions that could potentially be related to the effects of climate change. Staff would continue to collaborate with the U.S. Geological Survey and other partners to obtain climate-related information.

Staff would use information generated by the Great Northern Landscape Conservation Cooperative to understand climate change impacts locally. Refuge staff is not directing efforts toward inventorying, monitoring, and analyzing climate change effects. Activities that apply to climate change would be sporadic and opportunistic.

The refuge would strive to carry out actions in the Greater Yellowstone Area climate action plan (Fiebig 2011) to become carbon neutral by 2020. We are taking steps to reduce the carbon footprint of existing facilities: weatherproofing of facilities and upgrading furnaces, doors, and windows. We would use more webinars and other virtual meeting devices to reduce the carbon footprint from travel.

Landscape-Scale Conservation

The primary objective of landscape-scale conservation is to link existing protected areas, preserve wildlife corridors, and protect large, intact, functioning ecosystems while maintaining the rural character of northwestern Wyoming. The refuge is an active member of, and would continue to participate in, the Greater Yellowstone Coordinating Committee, which was formed to allow representatives from the National Park Service, USDA Forest Service, and our agency to pursue opportunities of mutual cooperation and coordination in the management of over 14 million acres of Federal lands in the Greater Yellowstone Ecosystem.

Private land development projects are subject to a review and approval process by the Teton County Planning Commission. Refuge staff periodically would provide comments, as requested, on proposals that might negatively affect refuge resources or the ability for wildlife to use these resources.

Habitat

Our focus would be protection of limited habitat resources.

Native Grasslands and Sagebrush Shrublands

The refuge would do minimal management other than fire suppression and invasive plant control; therefore, there would be little use of motorized vehicles in these areas.

We would maintain the native structure and composition of grassland and sagebrush shrubland com-

munities and protect them from degradation or allow them to recover, especially areas used by greater sage-grouse and other grassland- and sagebrush-dependent species. We would define the desired structural and compositional characteristics in a habitat management plan and maintain these conditions over time, but our emphasis would be to protect the dense, mature sagebrush stands from disturbance.

Wetlands

To benefit trumpeter swans and other wildlife, we would maintain existing artificial ponds and natural wetlands. The refuge would continue a low level of monitoring and treatment of noxious weeds in wetlands.

Riparian Woodlands and Aspen Woodlands Areas

Woody vegetation in riparian areas would recover as existing ungulate populations allow, and we would evaluate restoration techniques for riparian areas along Flat Creek. The refuge would continue to cooperate with the National Park Service on the Gros Ventre River hydrological assessment and would continue to evaluate the jackstraw technique to promote willow regeneration. The refuge would manage that segment of the Gros Ventre River east of the town of Kelly, consistent with the recently completed Snake River Headwaters Comprehensive River Management Plan.

Flat Creek Enhancement

The refuge would monitor 1 mile of construction work on Flat Creek (removal of ineffective structures) and associated removal of reed canarygrass that was completed in 2013 (FWS 2013). Monitoring is a critical aspect of restoration and habitat enhancement projects because it helps project proponents to assess project success.

Invasive Species

Staff would continue to control new and existing invasive plant infestations, including noxious weeds, using the integrated pest management strategies of biological control, mechanical control, grazing, and herbicides with cooperators and partners.

The refuge would continue to prevent new infestations of noxious weeds, nonnative grasses, and aquatic invasive species by preventing the artificial transportation of invasive plant seeds and other materials onto the refuge through efforts like (1) pub-

lic education, (2) weed-free-hay rules, and (3) the cleaning of all excavation and angling equipment before entering the refuge. Invasive plant species (some of which are classified as noxious by the State of Wyoming) are major contributors to the loss of quality wildlife habitat and rangeland, second in scope only to land development.

Examples of invasive plants that are not noxious weeds are crested wheatgrass, reed canarygrass, meadow foxtail, cheatgrass, and yellow sweet clover. Many of the nonnative plant species on the refuge do not provide quality elk forage or wildlife habitat. Although none of the following aquatic invasive animals and plants are known to occur here, refuge habitat potentially could be at risk from species such as these: zebra mussel, quagga mussel, Asian carp, hydrilla, Asian clam, Eurasian watermilfoil, and flowering rush.

Wildland Fire Management

For all habitat types at the National Elk Refuge, current wildland fire management is to fully suppress all wildfires. Potential benefits are not considered in the management strategy for a wildfire. Even though prescribed fire has occurred on the refuge in the past, prescribed fires have not been conducted since 2003. Therefore, prescribed fire is not currently being used as a management tool.

Wildlife

The emphasis would be on following the Bison and Elk Management Plan and managing for migratory birds, aquatic species, and wildlife disease.

Elk and Bison

We will manage the elk and bison herds as described in the Bison and Elk Management Plan. In some cases we developed complementary actions, which are more specific, that we describe under the habitat sections below.

Migratory Birds

To reduce disturbance to breeding bird populations, the refuge would maintain areas closed to public access during the breeding bird season of April–August in addition to closures during the winter.

Aquatic Species

The refuge would continue to work cooperatively with WGFD for fisheries management services. WGFD would continue to conduct various fisheries surveys including presence and absence, abundance, spawning, and angler surveys. The surveys would focus on the native Snake River cutthroat trout populations present in the Gros Ventre River, Flat Creek, and Nowlin Creek; WGFD also would conduct limited surveys in some of the artificial ponds on the refuge for presence and absence of native and nonnative fish species. WGFD would remove nonnative trout from these waters during all surveys. Brook trout in Flat Creek would be targeted for removal during their fall spawning period using electrofishing and fish trapping techniques. WGFD would house all survey data, manage for short- and long-term trends, and manage harvest regulations in cooperation with the refuge.



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River Otter

Disease Management

The refuge would work cooperatively with WGFD and Grand Teton National Park to conduct the disease management actions in the Bison and Elk Management Plan. The refuge would cooperate with WGFD to detect sick or dead bighorn sheep, and collected sheep would be tested for disease. We could continue to monitor amphibian populations at a level sufficient to detect negative effects of chytrid disease on amphibian populations. There would be no systematic surveillance to detect diseases in birds, but we would do opportunistic testing of sick and dead birds should abnormal levels of mortality become apparent.

The refuge would attempt to reduce brucellosis transmission from elk and bison to livestock by concentrating elk and bison on the refuge during the critical period of potential transmission (February–March). Given these constraints, we would conduct winter-feeding activities in a way that reduces brucellosis transmission within elk and bison herds.

We would complete a contingency plan for chronic wasting disease. The refuge would continue its herd-health monitoring program in cooperation with our Wildlife Health Office and continue to cooperate with WGFD on its monitoring program for chronic wasting disease. The refuge's current protocol to euthanize and remove animals that exhibit symptoms of chronic wasting disease would continue. We would continue to haze elk and bison off the refuge after the end of supplemental feeding to reduce the amount of time elk and bison are exposed to disease.

Federally and State-Listed Species

The refuge would continue to monitor greater sage-grouse, trumpeter swan, and long-billed curlew populations as resources allow. Based on this monitoring, the refuge would maintain areas closed to public access and limit refuge management activities to prevent unnecessary disturbance of species of concern.

Refuge biological staff would continue to participate in the local greater sage-grouse working group and coordinate with WGFD on its core area strategy for refuge management activities that might affect greater sage-grouse habitat.

Based on the population monitoring information, refuge management activities may need to be limited in trumpeter swan and long-billed curlew breeding areas. In addition, we would share the swan monitoring data with the Greater Yellowstone Trumpeter

Swan Working Group. When trumpeter swan nests were threatened by flooding, eggs would be salvaged, hatched in captivity, and cygnets returned to breeding territories.

Research and Monitoring

The refuge would design research and monitoring to inform resource management objectives related to the following:

- whether we are meeting the objectives of the Bison and Elk Management Plan
- population data for Federal threatened and endangered species and State species of concern
- modeling and decision-support tools
- effects of public use and other refuge programs on habitat and wildlife to adaptively adjusting management and public use programs

We would still rely on other agency and nonprofit partners to conduct some monitoring.

Cultural Resources

Staff would continue to document and protect new cultural resources as they are discovered. Staff would also protect existing known resources from vandalism, theft, and destruction. We would maintain and preserve sites with historical significance. As part of our implementation of the National Historic Preservation Act, we would identify cultural resources through archaeological surveys and consultation before starting ground-disturbing projects. Should archaeological resources be discovered during any construction, work would stop in that location until the resources were properly recorded by the Service and evaluated. Measures either to avoid further resource impacts or to mitigate the loss or disturbance of the resources would be implemented.

The refuge would continue to limit access to known archaeological sites to avoid loss or disturbance. We would allow public access only under supervised visits that have a specific purpose for viewing the sites.

The refuge's visitor services staff would continue to seasonally open the historic Miller Ranch to the

public as an interpretive site, relying on a large volunteer workforce as the sole means to staff and run the interpretive site. Volunteers would offer programs each summer at the Miller House, especially to youth groups. The Miller Barn would not be open to the public; the barn requires attention to ensure its preservation including foundation stabilization, improved drainage, repair of split or loose battens in the walls, and possible roof repairs.

Visitor Services

In addition to managing the wildlife-dependent recreational uses, the refuge would continue to administer other uses and refuge access and to provide public outreach.

Hunting

The refuge provides elk and bison hunting consistent with the Bison and Elk Management Plan, including (1) adaptively modifying elk and bison hunting regulations to achieve herd-size objectives, (2) extending accommodations for hunters with disabilities, and (3) offering a special elk hunt for young people during the elk season.

The refuge would continue to allow (1) elk and bison retrieval from hunt unit 80 on the Bridger-Teton National Forest to Elk Refuge Road south and west of the Twin Creek subdivision, (2) allow a ceremonial tribal bison hunt with annual harvest of up to five bison, (3) prohibit the hunting of any wildlife species other than elk and bison, and (4) promote voluntary use of lead-free ammunition. In addition, we would allow guided hunting under special use permit to increase harvest success, which would support the herd size objectives.

Fishing

The refuge would provide fishing opportunities during daylight hours as a compatible wildlife-dependent recreation opportunity. The current fishing access along Highway 89 would be maintained along with the parking turnouts on upper Flat Creek. Traditionally, access gates to lower Flat Creek are unlocked the night of July 31. A few anglers have used these accesses as early as midnight on the August 1 opener.

The Gros Ventre River, upper Flat Creek, lower Flat Creek, lower Nowlin Creek, and Sleeping Indian Pond would be open to fishing according to season dates and regulations set by the WGFD. We would keep closed to fishing all other refuge ponds, Flat Creek downstream from the old Crawford Bridge

site, and Nowlin Creek upstream from the posted fishing boundary. The refuge would issue special use permits for guided fishing on Flat Creek only.

Wildlife Observation and Photography

The refuge would maintain access to existing turnouts, trails, and other observation sites. The primary viewing turnouts and designated observation sites follow:

- The upper viewing platform on the second story of the visitor center.
- The Burt Raynes Boardwalk and remote-viewing platform on the eastern side of the visitor center lawn.
- A turnout north of the visitor center and the Flat Creek Bridge, which has a viewing platform and National Elk Refuge sign. The turnout is plowed in winter, thus providing year-round access to the turnout.
- A turnout along Highway 89 north of Jackson, which has a kiosk and interpretive panel about the purpose of the fence and elk “jumps” (refer to “Fencing” in chapter 4, section 4.3). The turnout is plowed in winter by the Wyoming Department of Transportation, giving travelers on Highway 89 a safe place to pull over and view wildlife. However, the plowed snow is piled up on the northern end of the turnout, blocking access to the kiosk and interpretive panel.
- Approximately 10 turnouts are available on Elk Refuge Road. They are plowed during winter to encourage vehicles to move off the road to view wildlife.
- The Jackson Hole Community Pathways completed the refuge’s North Highway 89 Pathway in 2011.

Although no designated auto tour route exists, Elk Refuge Road and Flat Creek Road would continue to remain open to the public for wildlife observation and access to national forest lands from May 1 through November 30. During winter months, 3.5 miles of Elk Refuge Road (from the refuge entrance to the Twin Creek subdivision) would continue to remain open (December 1–April 30) to provide access to the national forest and wildlife-viewing opportunities. Refuge staff would continue to coordinate with the Bridger-Teton National Forest on a winter clo-

sure of Elk Refuge Road beyond the Twin Creek subdivision. Closure of the road to the public beyond the subdivision is part of a larger area wildlife closure, which was established to protect and reduce the stress of wintering animals and to reduce wildlife conflicts with users during the winter.

Wildlife-touring companies would continue to be allowed on the refuge through a special use permit that outlines specific conditions for operation, including required safety mitigation. This addresses potential safety issues that could affect visitors or general traffic and congestion along the Elk Refuge Road. The visitor services staff would continue year-round communication with the wildlife-touring companies to provide them with current information about management practices, operations, and issues.

The refuge would continue to support a contracted sleigh ride program to offer a unique opportunity for observing winter wildlife. This program would continue to be part of the marketing efforts of the Jackson Hole Chamber of Commerce.

The refuge would continue its use of a Web-based photo-sharing site for refuge photos. This photo collection would help the staff with the many requests the refuge gets from publications, Web sites, communication specialists, the media, our regional and national Service offices, and other groups for photos of various events and scenery. The pictures are accompanied by interpretive text, photo credits, and information about when the photo was taken.

Environmental Education and Interpretation

To meet the demand for environmental education during the school year, the refuge would continue to use funding through nongovernmental partnerships to hire seasonal (winter) naturalists. Environmental education programs in the spring would be offered when possible through the use of volunteers. Spring environmental education programs would be limited because they occur at the same time as the large volunteer staff is arriving for the season; therefore, staff time devoted to public programs would be superseded by checking in and training volunteers and other seasonal staff.

The visitor services staff would continue to rely on a large workforce of residential volunteers as the means of offering formal and informal interpretation during the summer months when visitor center visitation peaks. Volunteers would also continue to provide interpretation during the winter months, although residential housing for volunteers is very limited during the winter.

The refuge would engage the public at the visitor center and provide climate change brochures offered



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Wildlife observation is a popular activity at the visitor center.

by the Grand Teton Association and literature we and the U.S. Department of the Interior produced.

The refuge would continue to support a contracted interpretive sleigh ride program during the winter and would work closely with the contractor to provide quality education and interpretation through this unique wildlife-viewing opportunity.

Refuge signs are aging and some are outdated. The staff would assess priorities and replace signs as funding and staff time allow.

Jackson Hole and Greater Yellowstone Visitor Center

The refuge would continue to pay for most of the annual operational and maintenance costs for the Jackson Hole and Greater Yellowstone Visitor Center, a multi-agency visitor center. The refuge has one employee assigned to work full-time at the visitor center, which has high year-round visitation. Each partnering agency—Bridger-Teton National Forest, Grand Teton Association, Grand Teton National Park, and Jackson Hole Chamber of Commerce—would continue to provide minimal staff at the information desk.

Other Uses

The National Elk Refuge is managed as a closed refuge, which limits public use except the uses previously described and the following approved uses. We would evaluate other uses occurring or proposed on the refuge, including wildlife-dependent and non-wildlife-dependent uses other than the six priority uses, for their appropriateness and compatibility with the purposes of the refuge in accordance with our policies (Appropriate Refuge Uses Policy and Compatibility Policy).

North Highway 89 Pathway

We would allow nonmotorized and pedestrian use of the North Highway 89 Pathway with a designated seasonal closure from November 1 through April 30 (based on a variety of data collection methods to assess wildlife movement) for protection of wildlife. Refuge staff would continue working with Jackson Hole Community Pathways and other advocacy groups for consistent outreach and messaging on pathway use, and we would encourage use of the pathway as an alternative transportation route for workers and visitors to and from town to the Grand Teton National Park. We would continue to prohibit pets and horses on the pathway.

North Park

The town of Jackson would continue to manage North Park under a memorandum of understanding with us. Jackson would continue to collect garbage and provide lawn care at North Park as well as conduct the fee-reservation system for the group picnic shelter.

Special Use Permits

We would issue special use permits for appropriate activities such as guided hunting and fishing, hunting retrieval services, commercial wildlife-viewing tours, professional photography and videography, and research projects. Each permit would have special conditions required to reduce impacts to resources and other activities. Before issuing special use permits in the greater sage-grouse core area, we would make sure to comply with Wyoming Executive Order 2011–5 and apply appropriate stipulations.

In many cases, permittees would be required to report use to the refuge at the end of the permit period, documenting the number of clients and trips onto the refuge. There would be no fees associated with special use permits. Staff availability would determine, case-by-case, if we would allow special access to closed areas of the refuge.

Commercial photographers would need to obtain special use permits to operate on the refuge. The special use permits stipulate special conditions such

as access into areas not open to the public. This ensures when the permittee is out shooting, a refuge official, contractor, volunteer, or agency partner has a way to verify whether a particular activity has been authorized if the permittee is not accompanied by a staff member.

The refuge would deny requests for activities that are not appropriate and compatible uses of the refuge, such as weddings at Miller House, photographers on feed trucks, and journalists on law enforcement ride-alongs.

The refuge would restrict precedent-setting special access requests that would be cumbersome to the refuge. The refuge receives many requests from individuals and user groups to be allowed special access to areas and to accompany refuge staff during management operations and other activities that are not available to the public. The high visibility of the refuge has the potential for special-exceptions requests to become unmanageable. Other similar users groups or individuals may want the same exception or opportunity, and refuge staff would have to be able to articulate in an equitable and justifiable manner why one person or group was allowed to do an activity and another was not. Refuge staff would need to carefully consider the nature of a request and consider that multiple similar requests that could ensue.

In the past, commercial horseback trail riding has been occasionally permitted along a 1-mile section of the Gros Ventre River in the northeastern corner of the refuge. We have denied requests to conduct this non-wildlife-dependent commercial use on other parts of the refuge because the benefits it provides in support of the refuge goals are minimal. The refuge would continue to allow this use as resources to manage the activity allow, including staff to issue and review permits, provide law enforcement oversight for public safety, and monitor and control new invasive plant infestations. There would be no expansion of commercial horseback trail riding.

Access

Some people want access to the refuge for refuge activities and to access the adjacent Bridger-Teton National Forest.

General Access and Elk Refuge Road

Elk Refuge Road, Flat Creek Road, and the Curtis Canyon Road would be open to the public for wildlife observation and access to national forest lands from May 1 through November 30. During the winter months (December 1 through April 30), 3.5 miles of the Elk Refuge Road (from the refuge entrance to the Twin Creek subdivision) would be open to provide wildlife-viewing opportunities on the refuge and one access point to the national forest.

Access to the National Forest

We would continue to limit access across the refuge to the national forest through three existing locations: Crystal Butte, Dry Hollow, and Sheep Creek. Antler collectors have also crossed the refuge and private land in recent years to access the national forest from the Gros Ventre River “jump cliff” site; however, the refuge has not sanctioned crossings at this site. The refuge is currently in discussion with other adjacent landowners to discuss the future use of this access point. The refuge would need to evaluate the use of this site as an access point to the Bridger Teton National Forest.

We would continue to allow overnight parking on Elk Refuge Road on April 30 to accommodate antler hunters accessing the opening of the national forest winter range on May 1.

Winter users of the Goodwin Lake Ski Cabin on the Bridger-Teton National Forest would continue to have restricted access across the refuge (only a few hundred yards) on a designated trail to reach the national forest boundary. Refuge or visitor center staff would issue a permit with regulations such as a restricted travel route to the cabin, egress from national forest property that includes no trespass on private property, and dates when the activity is allowed. Refuge maintenance staff would plow a small parking area with room for two cars near the entrance to the Twin Creek subdivision.

Public Outreach

The purpose of public outreach is to build an understanding of our Service mission, natural elk and bison behavior, population fluctuations, and ecological relationships to other species, as well as refuge management practices.

Because of the refuge’s high-profile location, the “flagship refuge” status, and the complexity and controversial nature of many of the management issues, the need for regularly occurring public outreach is critical. The refuge’s visitor services staff would prepare and send out news releases about visitor opportunities and management activities as staff workload allowed. The staff would also prepare and distribute articles, as workload allowed, on refuge management operations, research, and visitor services for internal and external audiences to inform audiences about the scope and complexity of refuge activities. We would send out news releases, articles, and other refuge information via a current email contact list that has elected officials, Federal and State partners, non-profit conservation and partner organizations, key community and business leaders, special use permittees, and regional and national contacts in our agency. In addition, the visitor services staff would

keep current the refuge Web site and photo gallery and would develop and use other forms of electronic media as workload allowed.

The refuge has seen an increase in the number of requests for media interviews and filming for travel shows, publications, and documentaries. The refuge would continue to conduct media interviews and accommodate film crews for local, national, and international audiences as workload allowed.

Refuge leadership would continue to take an ambassadorial and leadership role in the community, including extensive involvement in a variety of partnerships.

Visitor and Employee Safety and Resource Protection

We would continue to emphasize visitor and employee safety in all operations on the refuge. Hunting regulations and program design would focus on the safety of the refuge user and surrounding community. Safety rules, procedures, job hazard analyses, reporting requirements, and regional safety office oversight would help to keep refuge employees safe while working to achieve station objectives. Law enforcement officers stationed at the refuge would continue to promote visitor and employee safety.

Law enforcement efforts on the refuge protect natural and cultural resources, refuge facilities, visitors, and employees. Resource protection programs would continue at a basic level and focus on hunting and fishing programs, antipoaching activities, boundary and signing activities, and enforcing the prohibition on collecting shed antlers. Present staff size would remain minimal, and the refuge would continue to rely on the Teton County Sheriff’s Office, National Park Service, WGF/D, and the Service’s law enforcement officers throughout the year for basic law enforcement presence and call response.

Administration

To perform our responsibility to administer all aspects of the refuge, we rely on our Government-funded budget and the associated staff and facilities it supports. In addition, our partners often provide crucial support.

Funding and Staff

We would keep our current staff level of 10.5 FTE positions (refer to table 3 for a list of current staff

Table 3. Current staff positions at the National Elk Refuge, Wyoming.

<i>Government-funded position</i>	<i>Full time equivalent</i>
Wildlife Disease	1
Deputy refuge manager (GS-485-13)	1
Outdoor recreation planner (GS-0023-12)	1
Park ranger (GS-0025-9, visitor center manager and volunteer coordinator)	1
Wildlife biologist (GS-486-12)	1
Refuge land management officer (GL2-1801-9)	1
Office assistant (GS-0303-5)	0.5
Heavy mobile equipment mechanic (WG3-5803-11)	1
Maintenance mechanic (WG-4749-9)	1
Rangeland management specialist (GS-454-9)	1
Budget analyst (GS-0560-11, business team)	1

¹ GS=General Schedule classification and pay system.

² GL= General Schedule classification and pay system for law enforcement officers.

³ WG= Wage Grade classification and pay system.

positions). More staff would be hired as money became available through the Refuge Operations Needs System.

The refuge would continue to rely on volunteers and unpredictable nongovernmental money to hire seasonal employees needed to achieve critical refuge programs. An additional 12.5 FTEs of volunteer and seasonal staff assistance would be used to augment the Government-funded 10.5 FTEs of refuge staff. The volunteers and temporary, seasonal staff would be as follows:

- one volunteer for the biological program fieldwork
- eight seasonal irrigators
- one seasonal supplemental feed operator
- twenty volunteers to staff the visitor center and Miller House
- three winter naturalists to offer programs and staff the visitor center
- eight Service law enforcement officers to patrol during the May 1 opening of the winter range on the Bridger-Teton National Forest for antler collection
- two seasonal National Park Service law enforcement officers for hunting season enforcement

Facilities

“Operations and maintenance” consist of maintaining facilities, infrastructure, vehicles, and other equipment in good working condition through the use of annual and deferred maintenance funds to achieve management goals. Priorities would be set for the limited maintenance money to meet needs that affect key operational and visitor services infrastructure. The refuge would continue to provide some form of Government housing, which would help us recruit highly qualified staff and volunteers that would be able to afford our reasonably priced housing.

Elk Refuge Road

Elk Refuge Road provides safe, reasonable, uninterrupted access (ingress and egress) for our agency staff, the public, and private landowners year-round and is a popular winter wildlife-viewing area. Opening parts of the road would allow the public seasonal access to national forest lands.

We would continue to enforce a regulation for no stopping or parking on the roadway to prevent obstruction to other vehicular traffic using the road. Two nearby, heavily visited national parks allow frequent stopping in the road to take photographs or view wildlife. Many of the same visitors travel on Elk Refuge Road, bringing with them the same habits and viewing practices they exhibited in the national parks during their same vacation stay. Because visitors to the refuge do not pass through a designated entrance kiosk where they make a contact with a refuge employee, it is difficult to educate them about regulations about not stopping in road. Regulations pertaining to parking on the road would continue to

be listed at a wayside exhibit kiosk at the entrance to the refuge, but few visitors stop to thoroughly read through the information before proceeding onto Elk Refuge Road. A handout listing regulations, along with a map showing the turnouts, would continue to be available at the visitor center.

The county road easement would continue to be treated for dust abatement during summer months, which creates a bighorn sheep attractant (from the salt in the treatment) on and along the roadway. Magnesium chloride (salt)-treated water, used for dust abatement during the summer, would remain on the road surface throughout the year and serve as an attractant that draws bighorn sheep to the road surface during the winter. Large numbers of bighorn sheep would continue to gather on the road, creating a congested and sometimes fully obstructed roadway. The obstructed road is a safety issue, especially for through traffic (local residents, deliveries, refuge staff, and refuge feeding operations).

During the winter, we would continue to plow snow off the road's current 10 turnouts to encourage vehicles to move off the road to view wildlife.

Partnerships

Staff would work to maintain existing partnerships that address resource information needs, protect and enhance habitat (both public and private), and promote public use, education, and outreach. Current partners include local private landowners, governmental agencies, and nongovernmental organizations. The refuge involves local conservation organizations in supporting educational events and fosters partnerships with local communities for resource protection, and promotes continued grant development with partners seeking money to accomplish mutual goals.

The refuge would continue to work with State and county agencies to accomplish mutually beneficial projects. Examples of ongoing collaboration include habitat improvement projects for Flat Creek, documentation of habitat conditions through high-resolution aerial photography, invasive plant species control, wildlife and disease monitoring, and the monitoring and operation of a nonmotorized pathway along the western refuge boundary. We would coordinate with WGFD on various projects including greater sage-grouse habitat, particularly near occupied leks within core areas delineated by the State of Wyoming Greater Sage-Grouse Core Area Protection Executive Order 2011–5.

The refuge would continue to support and take part in multi-agency wildlife work groups such as the Jackson Cooperative Elk Studies Group, the Greater Sage-Grouse Working Group, and the Jackson Inter-agency Habitat Initiative (works on winter and tran-

sitional range improvements). We would collaborate with the Jackson Hole Weed Management Association to manage invasive species on the refuge and throughout the ecosystem.

Coordination with nongovernmental conservation organizations would continue to complete refuge projects that benefit wildlife such as the program for voluntary use of lead-free ammunition, which would provide benefits to wildlife beyond the refuge boundary.

The refuge would continue our close partnership with the Jackson District Boy Scouts that collect elk antlers on the refuge and conduct the Boy Scouts of America Elk Antler Auction each year, with most of the proceeds coming to the refuge to support our programs.

We would develop partnerships to find solutions and educational opportunities to resolve elk and bison conflicts on private and public land.

The refuge would continue to work in partnership with the Grand Teton Association to support visitor services programs that relate to interpretation, education, research and the operation of the multipartner Jackson Hole and Greater Yellowstone Visitor Center.

3.6 Alternative B (Enhance Public Use and Intensive Resource Management)

An important aspect of this alternative would be to limit public use to appropriate and compatible wildlife-dependent uses—hunting, fishing, wildlife observation, photography, environmental education, and interpretation—and shift away from non-wildlife-dependent uses. There would be increased development in some areas of the refuge to address increased public use at area-specific intensive use locations. Options to experience and observe would be enhanced.

The other emphasis would be to meet habitat and wildlife population objectives through intensive management actions. Because of increased public opportunities, refuge staff would focus more on intensive refuge-specific monitoring, rather than ecosystem monitoring, to gauge the effects of public use on habitat and wildlife.



Chuck Muleahy / FWS

A chuck wagon located at the Miller House provides a unique learning opportunity.

Climate Change

Management actions would be the same as alternative A. In addition, staff would cooperate with the Great Northern Land Conservation Cooperative to conduct research and monitoring and carry out management as necessary to reduce adverse climate change effects on high-priority refuge resources. Efforts would focus on bison, elk, and Federal trust resources.

Landscape-Scale Conservation

Management actions would be the same as alternative A. In addition, we would consider partnership opportunities to build wildlife crossings for Highway 89—such as under-road tunnels, overpasses, or fences on the west side of the highway—to reduce collisions between vehicles and animals.

Habitat

The emphasis would be to meet habitat objectives through intensive management actions.

Native Grasslands and Sagebrush Shrublands

Management actions would be the same as alternative A. In addition, the refuge would develop and carry out habitat projects in coordination with the local greater sage-grouse working group and WGFD to meet desired conditions. Considering greater sage-grouse concerns, we would introduce prescribed fire to enhance the quantity and quality of forage for elk and bison.

Wetlands

Management actions would be the same as alternative A. In addition, the refuge would improve its ability to manage water levels in artificial ponds and would manage water levels to enhance habitat for trumpeter swans. In natural wetlands, the refuge would increase monitoring for and control of invasive species and use prescribed fire to enhance the quantity and quality of forage for elk and bison.

Riparian Woodlands and Aspen Woodlands Areas

Management actions would be the same as alternative A. In addition, the refuge would use the efficiencies in the irrigation system to keep more water in Flat Creek and improve riparian habitat. We would consider expanded techniques for regeneration of woody vegetation. In the Gros Ventre River drainage, the refuge would carry out recommendations from the hydrologic assessment conducted by the National Park Service, as appropriate.

Flat Creek Enhancement

Management actions would be the same as alternative A.

Invasive Species

Management actions would be the same as alternative A. In addition, there would be increased monitoring and rapid response for new infestations of invasive species, including aquatic plant and animal species. Refuge staff would also develop large-scale programs for invasive plant eradication where possible.

Wildland Fire Management

Actions would vary depending on the type of habitat.

Native Grasslands and Sagebrush Shrublands

Wildfire suppression same as Alternative A. Prescribed fire would be introduced to enhance the quantity and quality of forage for elk and bison, reinvigorate native species, and to reduce hazardous fuels.

Wetlands

Wildfire suppression same as Alternative A. Prescribed fire would be introduced to enhance the quantity and quality of forage for elk and bison, reinvigorate native species, and to reduce hazardous fuels.

Riparian Woodlands and Aspen Woodlands Areas

Wildland fire management in this habitat type would be the same as Alternative A.

Wildlife

The emphasis would be to meet wildlife population objectives through intensive management actions.

Elk and Bison

Management actions would be the same as alternative A.

Migratory Birds

Management actions would be the same as alternative A. In addition, we would increase monitoring to establish baseline information on the migratory bird species that occupy the refuge.

Aquatic Species

Management actions would be the same as alternative A.

Disease Management

Management actions would be the same as alternative A. In addition, the refuge would develop a comprehensive disease contingency plan in coordination with WGFD and Grand Teton National Park that focused on intervention where not constrained by the Bison and Elk Management Plan. As part of this pro-

cess, the refuge would develop alternative strategies to dispose of diseased elk and bison carcasses.

Federally and State-Listed Species

Management actions would be the same as alternative A. In addition, the refuge would increase monitoring of other State species of greatest conservation need in coordination with WGFD. Where appropriate, the refuge would support the goals of recovery plans for federally listed species through management activities.

Staff would initiate intensive management actions to enhance trumpeter swan production on the refuge. The refuge would enhance swan habitat to meet objectives of the Pacific Flyway Management Plan for the Rocky Mountain Population of Trumpeter Swans (Subcommittee on Rocky Mountain Trumpeter Swans 2012), referred to as the Trumpeter Swan Management Plan. We would design these enhancements to maximize nesting and breeding areas visible to the public. For flooding situations, the refuge would (1) consider removing swan eggs and returning cygnets (young swans) to breeding sites after hatching, (2) use floating nest structures to mitigate for the effects of human disturbance and flooding, and (3) construct more managed ponds suitable to support nesting swans in appropriate areas.

Research and Monitoring

Management actions would be the same as alternative A. In addition, the refuge would increase research and monitoring of the effects of public use and other refuge programs on habitat and wildlife and adaptively adjust management and public use programs. We would increase all research and monitoring efforts to improve our confidence in the data gathered.

Cultural Resources

Management actions would be the same as alternative A. In addition, we would develop an interpretive trail around the Miller Ranch buildings, inviting visitors to explore the cultural as well as natural aspects of the refuge. We would seek money for per-

manent or seasonal interpreters to maintain and enhance programs at the Miller House.

Refuge staff would work with partners and our agency specialists to address the foundational deterioration and other structural issues at the Miller Barn. We would include in planning or rehabilitation work done on the barn the use of the structure for interpretive programs. The barn repair work would include foundation stabilization, improved drainage, repair of split or loose battens in the walls, and possible roof repairs. The barn is not open to the public now and would need to be inspected for items such as floor load capacity, safety, fire codes, and egress. Lighting would need to be installed. Refuge staff would need to apply for grants or other funding sources to pay for the Miller Barn restoration. Historic preservation specialists would have to be contracted to work with refuge staff to make sure preservation standards and protocols were met. The refuge would rehabilitate the other Miller Ranch buildings as needed.

Visitor Services

We would limit public use to appropriate and compatible wildlife-dependent uses.

Hunting

Management actions would be the same as alternative A. In addition, the refuge would expand hunting opportunities for young people. This may include working with partners to develop a hunter mentoring program and moving the existing hunting opportunity for young people to later in the season to provide more elk observation opportunities and increase the chances for successful harvest. Potential options would include designating a weekend in midseason for youth-only hunts or adding a weekend after the end of the elk season for a youth-only hunt.

Staff would develop regulations for proper storage of bear attractants and bear-deterrent practices when hunting on the refuge. We would encourage hunters to carry bear spray while on the refuge, and we would consider enacting a bear spray carry requirement. Staff would develop management tools for assessing hunter use—such as hunter checkpoints, hunter success surveys, and improved mandatory reporting of tag use—to better manage hunt program opportunities.

The refuge would consider and create more hunting opportunities. As the need arises, we would analyze and consider developing hunting opportunities for species other than elk and bison. Staff would coordinate with WGFD to develop specific refuge-hunting

opportunities to meet population objectives in the Bison and Elk Management Plan. We would also work with WGFD to develop an antlered elk hunt on the refuge to provide more quality opportunities.

We would open the currently closed areas on the southern and western boundaries of the refuge to archery hunters to create more harvest opportunities and add access for archery hunters at the Jackson National Fish Hatchery. The refuge would explore the idea of adding access for bison hunters on the northern end of the refuge through the Teton Valley Highlands subdivision to either hunter retrieval road 6 or 7.

Fishing

Management actions would be the same as alternative A. In addition, besides sponsoring Kids' Fishing Day with the Jackson National Fish Hatchery and the WGFD, the refuge would like to start programs that attract more young people to the refuge for fishing opportunities, using volunteers or partners as instructors. Programs could include casting instruction, a fishing skills clinic, and a mentoring program for young anglers.

We would change the scheduled opening of the two access gates to lower Flat Creek, along Highway 89, to daylight (6 a.m.) on the August 1 season opening, which would be consistent with refuge regulations. This would be a change from the current situation; we would no longer open the gates the evening before the fishing season opening.

The Flat Creek fishery is managed for a native, wild and trophy-sized Snake River cutthroat trout population. Long-time devotees of Flat Creek report a decline in the opportunity to fish for large cutthroats. Recent fish surveys show that nonnative trout (brook, brown, and rainbow) account for almost half of the trout population of the stream. The typical Flat Creek anglers are avid flycasters that have adopted catch-and-release principles as their conservation ethic. There is a need for active management of this fishery to support the quality of the fishing experience. We would do more angler education about (1) nonnative trout (competition and hybridization) in the Snake River cutthroat trout fishery and (2) the importance of Flat Creek for the recruitment of Snake River cutthroat trout to the Snake River fishery.

Flat Creek is a popular fishing destination especially in August, and there are times when overcrowding affects the quality of the fishing experience. To control some of the future use of lower Flat Creek and make it easier to enforce permit requirements, the refuge would set a limit of 10 or fewer special use permits for commercial guided fishing. To limit the crowding from guided fishing, per-



Lori Iverson / FWS

Hunting is one of many wildlife-dependent activities available on the refuge.

mits would have quotas of two trips, two guides, and a maximum of two clients per day. An annual \$100 fee for each commercial guide permit would provide financial support for the fishing program's administrative expenses, such as for access signage and the printing of fishing regulations. In addition, we would construct an accessible fishing platform to access Flat Creek.

We would require commercial guides to kill non-native fish, such as brook, brown, and rainbow trout, as a condition of their special use permits. Nonnative trout are classified as game species, and we would require these fish to be included in an angler's daily possession, consistent with State regulations.

Staff would improve habitat and waterflow management for increased fishing opportunity, with a focus on native fish species. We would also work with partners to enhance fisheries management to encourage native species in the Gros Ventre River by using fish screens or a similar tool. Fish screens may be beneficial; however, we would carefully evaluate the need because installation and maintenance of fish screens can be very expensive. Fish screens on the Gros Ventre River might prevent migration of rainbow trout into the Flat Creek cutthroat population.

Fisheries habitat improvement and angler opportunity in Flat Creek would be greater than alternative A and similar to alternative A in the Gros Ventre River.

Wildlife Observation and Photography

Management actions would be the same as alternative A. In addition, the refuge would develop pathway pulloffs along the North Highway 89 Pathway and a more prominent access route, designed for accessibility, across the visitor center lawn to the existing remote-viewing platform. We would develop an accessible boardwalk through already disturbed wetland areas near the visitor center with a photo blind along the boardwalk for noncommercial photography. Using webcams on the refuge would provide wildlife-viewing opportunities such as observation of nesting swans. We would develop a wildlife checklist for the refuge.

Environmental Education and Interpretation

The refuge's education and interpretation programs would reflect refuge resource issues. We would use the existing North Highway 89 Pathway to interpret wetland values or other interpretive messages. The refuge would use public information to promote understanding of invasive species control and prescribed fire as a management tool. We would increase public education about the migratory birds using the refuge and the importance of keeping areas closed to the public during the bird breeding season. To allow the public to view nesting birds without disturbing them, we would use strategies such as webcams on the refuge and an online photo gallery. We would seek more money for permanent or seasonal

interpreters to improve programs at the visitor center, Miller House, and offsite areas.

The refuge would develop a self-guided, interpretive tour route on existing refuge roads on the eastern side of the refuge (Elk Refuge Road and Flat Creek Road). The route would have interpretive turnouts, signs, and possibly an accompanying brochure. We would need to update and replace interpretive signs with panels related to the tour route theme. The refuge would develop the tour route in three phases:

1. First phase (winter route)—Develop the route from Elk Refuge Road entrance to Twin Creek subdivision for approximately 3.5 miles.
2. Second phase (summer route)—Develop the route from Twin Creek subdivision to the McBride area; open May 1–December 1 with an interpretive kiosk at the McBride parking area.
3. Third phase—Increase traffic control signing from the McBride area to the eastern parking lot and include the traffic information in the brochure.

For Elk Refuge Road, the refuge would consider (1) developing an interpretive brochure that corresponds with numbered turnouts and has winter and summer information or (2) having standalone interpretive panels. We would consider mounting scopes at the turnouts to encourage people to get out of their vehicles. During busy periods, refuge naturalists would be on scene to present the educational component. In addition, we would need to address safety mitigation during critical times of the year such as during hunting season and when bison moved through the refuge. For summer use of the road, the refuge would implement a themed interpretive signing program, possibly answering the question “Where are all the elk?”

As a way to provide interpretive information to the public, the refuge would add special conditions in the special use permits for wildlife tour companies to use or mention the tour route. Charging fees would help to offset our administrative costs.

We would continue to assess the number of people that regularly watch the refuge video to decide if it should be updated. An option would be to produce a selection of shorter multimedia presentations that would be available to the public on demand rather than offering a full-length video. The multimedia presentations could also be housed on the refuge Web site or be downloaded by visitors at the visitor center. The video presentations would emphasize the

role and mission of national wildlife refuges versus national parks and national forests, as well as describe the role of the refuge in the Greater Yellowstone Ecosystem.

We would stabilize and restore Miller Barn as an interpretive site where we could hold programs and events.

Jackson Hole and Greater Yellowstone Visitor Center

The designated partners in the Jackson Hole and Greater Yellowstone Visitor Center would contribute annual funding to help with operations at the visitor center and ease the growing financial burden to the refuge. We would continually document and evaluate the visitor center condition and maintenance issues, ensuring that replacement and maintenance cost estimates were current. We would rehabilitate the existing building, or we would build a new visitor center to address the ongoing repairs to the aging building, maintenance deficiencies, and lack of compliance with the Architectural Barriers Act Accessibility Standard (United States Access Board 2013). A rehabilitated, expanded, or remodeled visitor center or a new visitor center would also address the lack of space for interpretive programs and presentations to schools and other groups.

Other Uses

We would not develop hiking and biking trails, but participants in these activities might use the new self-guided, interpretive tour route described earlier. We would follow our agency policy that prohibits weddings on refuge property, including public use areas such as North Park, the Miller House, and the visitor center.

North Highway 89 Pathway

Management actions would be the same as alternative A. In addition, the refuge staff would apply criteria and determine, on a yearly basis, whether the pathway can be opened as early as April 15 in years when spring arrives unusually early. We would use the pathway during the open season as an interpretive programming venue. The refuge would explore a variety of data collection methods to assess wildlife movement across the pathway at various times of the year, especially during the times of year when the pathway is closed. Refuge staff would cooperate with Teton County to evaluate pathway impacts on wildlife and habitat and adjust use as appropriate.

North Park

When the memorandum of understanding with the town of Jackson expires in 2015, we would continue the partnership with Jackson to manage North Park through a revised memorandum that does away with the reservation and fee collection system for activities on refuge land.

Special Use Permits

Management actions would be the same as alternative A. In addition, we would charge fees for special use permits for commercial photography and filming, wildlife-viewing, and other commercial activities including those for access to refuge areas closed to the public. There would be a flat fee for all commercial special use permits and a general use fee related to the amount of time for each specific use. Many of the same permittees would also obtain special use permits in neighboring Grand Teton National Park, which has a fee system in place for similar activities.

Issuing a permit to a filmmaker would ensure that, when the film permittee was out shooting, a refuge official, contractor, volunteer, or agency partner could verify whether a particular activity had been authorized if the permittee was not accompanied by a staff member. Recognition of the National Elk Refuge and the National Wildlife Refuge System would be a requirement of the permit.

In the past, commercial horseback trail riding has been occasionally permitted along a 1-mile section of the Gros Ventre River in the northeastern corner of the refuge. We have denied requests to conduct this non-wildlife-dependent commercial use on other parts of the refuge because the benefits it provides in support of the refuge goals are minimal. Managing this use diverts limited refuge staff and management resources away from critical programs. The introduction of invasive plants through horse manure is an unnecessary risk for a non-wildlife-dependent commercial use. However, the use of horses is allowed by hunters and commercial hunting guides to support hunting, a wildlife-dependent use and a vital tool for management of elk and bison populations. The refuge would phase out this use within 5 years, and there would be no expansion of commercial horseback trail riding.

Access

Management actions would be the same as alternative A, with the following changes.

General Access

The refuge would analyze and consider more hunter access areas and designated parking lots. We

would consider more bison hunter access on the northern end of the refuge though the Teton Valley Highlands subdivision—either on the western end of the subdivision to hunt retrieval road 6 or on the eastern end of the subdivision to hunt retrieval road 7. In addition, the refuge would consider archery hunter access on the western boundary of the refuge next to the Jackson National Fish Hatchery.

Elk Refuge Road

Management actions would be the same as alternative A.

Access to the National Forest

We would prohibit the overnight parking, camping, staging, and tailgating on April 30 on the refuge associated with antler collection on the adjacent Bridger-Teton National Forest. The refuge would consider an alternate gate opening time. By having a later gate-opening time than other national forest access points, refuge staff might be able to reduce or eliminate persons interested in staging on Elk Refuge Road. Users that learned other accesses onto the national forest would be opening before the refuge access might be discouraged from using Elk Refuge Road, knowing other antler collectors would be reaching the same destinations sooner.

The refuge would encourage the national forest to provide added signing for the egress route to prevent trespass on private land at the Twin Creek subdivision by people traveling to and from the Goodwin Lake Ski Cabin. We would ask the national forest to issue special use permits (rather than the refuge) for parking on refuge since the associated activity takes place on the national forest and the trespass violations occur by travelers leaving the forest and continuing through private property.

Public Outreach

Management actions would be the same as alternative A. In addition, because of the wide audience and interest in the National Elk Refuge, we would develop more media and outreach venues available to the public. The role of the refuge in the Greater Yellowstone Ecosystem would be emphasized in additional outreach. Program outreach would include the following:

- The refuge would provide more outreach for other refuge users to promote education and awareness of the refuge hunting program.
- The refuge needs more angler education about the negative effects of nonnative fish on the native Snake River cutthroat trout

fishery and to encourage angler harvest of nonnative trout.

- Outreach would be necessary to inform local justices of the peace, or anyone that has authority to perform legal wedding ceremonies, that weddings are not allowed on refuge property.
- Because we would no longer allow overnight parking the night before the winter range opening on the Bridger-Teton National Forest, the refuge would provide timely outreach to let people know about this change.

Visitor and Employee Safety and Resource Protection

Management actions would be the same as alternative A. In addition, there would be an increased law enforcement presence during the hunting season as it continued to grow and become more complex. In coordination with WGFD, the refuge would develop strategies to increase hunter safety. Expanded hunt areas have created more situations where hunters must use their discretion whether or not a safe shot can be taken. Refuge staff and WGFD staff need to check such areas and make adjustments to roads available to hunters, placement of hunt parking areas, and hunt area boundaries, as necessary. Law enforcement staff would administratively revoke more hunting permits in situations where the hunter endangers public safety or knowingly violates refuge regulations or State or Federal laws. Furthermore, violations could affect a hunter's ability to get future hunting permits or renew a special use permit.

The refuge would acquire all personal protective equipment as necessary for duties performed. Safety training would be available as needed.

Law enforcement staff and patrols would be increased:

- Increased patrols would be needed in April to deter refuge trespass and the illegal removal of shed elk antlers and other wildlife parts.
- The increased law enforcement staff would develop additional techniques (such as remote cameras, tracking devices, and motion sensors) to detect the illegal taking of wildlife and wildlife parts during known peak seasons such as the spring antler season. The staff would continue to expand the

use of remote surveillance technologies and tracking devices.

- There would be 7-day-per-week coverage by law enforcement staff year-round to address increased public use.
- There would be increased enforcement of regulations related to Elk Refuge Road. Refuge law enforcement would continue to enforce the provisions of 50 CFR 27.31(h).

We would consider designating off-road parking at the entrance with a relocated entrance kiosk.

Administration

To perform our responsibility to administer all aspects of the refuge, we rely on our Government-funded budget and the associated staff and facilities it supports. In addition, our partners often provide crucial support.

Funding and Staff

Refuge base funding would increase by approximately \$200,000 per year to replace private funding generously provided by refuge partners. Volunteers would remain a crucial part of the refuge workforce.

In addition to the existing refuge staff of 10.5 FTE positions, the following 15 FTE positions would be hired as permanent full-time or permanent seasonal refuge employees:

- one permanent full-time biological technician
- one permanent engineering equipment operator
- six permanent seasonal irrigators
- two permanent seasonal supplemental feed operators
- one permanent full-time environmental education specialist
- three permanent seasonal winter interpretive naturalists
- eight permanent seasonal visitor center desk staff members
- one permanent full-time law enforcement officer
- one permanent full-time maintenance program supervisor

Seasonal volunteers would still make important contributions by enhancing the mission work of the refuge.

Facilities

Management actions would be the same as alternative A. In addition, as money became available, the refuge would add up to five family houses and add housing to accommodate seasonal staff. This would help mitigate the extremely high cost of living.

Refuge facilities are located in or near Jackson, which is near Federal lands that support a variety of wildlife. Black bears live in the Bridger-Teton National Forest surrounding the town of Jackson and occasionally enter the town. Grizzly bears have been seen within 5 miles of refuge houses. Bears that become habituated to human garbage or other food rewards, would be relocated or destroyed. Local regulations have been passed to manage household garbage storage and disposal to prevent access by bears, which can quickly become habituated to this food source. The refuge would develop garbage storage and disposal rules for refuge residents that are consistent with the spirit of local regulations; these regulations would describe proper trash disposal, food storage, and use of bird feeders.

In cooperation with WGFD, the refuge would remove the existing, dysfunctional, elk trap corral at the northern end of Miller Butte and replace it with a prefabricated elk trap. The new prefabricated elk trap could be moved to various locations on the refuge to facilitate elk disease sampling, collaring, and research. The new elk trap could be disassembled and stored when not in use.

The Calkins House would be relocated or demolished and replaced in a new location when deferred maintenance money became available.

Elk Refuge Road

Management actions would be the same as alternative A. In addition, we would work with Teton County to modify dust abatement applications on the road to reduce the attraction to wildlife, especially bighorn sheep. The refuge would properly locate and increase the number of turnouts along Elk Refuge Road for winter use. Several of the existing 10 turnouts are poorly situated or are too small to accommodate the volume of use the road receives. Numbered turnouts would correspond with a winter auto tour brochure. We would add new regulatory signing to prohibit stopping or parking on or along roadway. In addition, we would consider widening the road to create more room for all road users. Public comments have suggested widening the road to three lanes, thereby making a parking lane for wildlife watching and more safely accommodating pedestrian traffic. The road widening is suggested for 1.5 miles along the base of Miller Butte. We would work with Teton County to discuss ways to make the road

safer—widen, lower the speed limit, improve visibility, eliminate blind spots, realign the road at Miller House, scrape down berms, and add regulatory signage—and create more room for all road users.

In winter, the refuge would sand the road and clear the ditches of snow for safety purposes. Elk Refuge Road in the winter is heavily travelled because of the attraction of a highly visible herd of bighorn sheep. Some motorists are visitors in rental cars who are poorly skilled winter drivers; many of them end up in the roadside ditch. This section of roadway requires extra maintenance, beyond what the county provides, to accommodate visitor use.

Despite the large number of summer visitors to Jackson Hole, the refuge is largely closed to public use during summer with the only refuge access for the throngs of summer visitors being Elk Refuge Road. Contacts with summer visitors along the road usually find them lost or confused. For the extremely heavy summer visitation, the road would be maintained at a higher standard, have enhanced traffic signs, and have speed limit signs installed north of the Curtis Canyon Road.

We would increase enforcement of current regulations.

Partnerships

Management actions would be the same as alternative A. In addition, a nonprofit, National Elk Refuge Friends group would be established to help support the vision of the refuge. Refuge Friends groups have been established throughout the Refuge System to help support the mission of the Refuge System and individual national wildlife refuges. These groups are sanctioned by and receive training and support from the National Wildlife Refuge Association, an independent nonprofit organization whose mission is to conserve America's wildlife heritage through strategic programs that protect, enhance, and expand the Refuge System and the landscapes beyond its boundaries that secure its ecological integrity. The refuge would need to work closely with the Grand Teton Association to distinguish between the role of the cooperating association and the Friends group.

The refuge would increase the emphasis of wildlife projects on private lands by encouraging use of the Partners for Fish and Wildlife Program in Teton County. This is a U.S. Fish and Wildlife Service program that provides money and technical expertise to private landowners for projects that would benefit wildlife. These projects are often conducted on private lands near refuges to provide secondary benefits to refuges.

3.7 Alternative C (Emphasize Intact Ecosystems and Promote Natural Processes)

Given the National Elk Refuge is part of the Greater Yellowstone Ecosystem, one of the largest relatively intact ecosystems on the planet, refuge management would emphasize those qualities that make the ecosystem unique.

Public use emphasizes interpretation, education, and outreach over recreational opportunities that are direct experiences. Educational and interpretive programs would include more experiences off the refuge.

Climate Change

Management actions would be the same as alternative B. In addition, the refuge would focus on building resiliency in the natural systems, mainly on the northern end of the refuge, with the full complement of historical plant and animal species. Management actions would emphasize natural processes, including fire, hydrology, and ungulate grazing, that result in healthy and diverse native plant communities that support a full complement of native wildlife species:

- Work with adjacent landowners to minimize water diversions from the Gros Ventre River and maintain natural flow levels.
- Restore native plant communities in areas currently dominated by nonnative species, with an emphasis on native species that would best match predicted changes in precipitation and temperature.
- Manage fire regimes that mimic pre-European settlement fire-return intervals.

Landscape-Scale Conservation

Management actions would be the same as alternative B. In addition, conservation organizations would be involved in reducing rural development or land use that would adversely affect wildlife and other important natural resources. The refuge would engage in and support projects that would benefit natural ecosystem processes or protect and enhance wildlife corridors. These projects might occur on private or public lands.

Land use outside the refuge impacts refuge resources. The refuge would seek to expand the approved acquisition boundary to include the Twin Creek and Spring Gulch areas, which would provide another tool to resolve off-refuge land use that conflicts with refuge resource protection. We would consider land exchanges with other landowners and agencies to simplify the refuge's exterior boundary.

Habitat

The focus would be preserving intact native plant communities.

Native Grasslands and Sagebrush Shrublands

Management actions would be the same as alternative A. In addition, the refuge would emphasize a mix of age and structural classes representative of historical conditions, reached using prescribed fire and managed wildfire, but like alternative A, the emphasis would still be to protect existing, mature, dense sagebrush stands from fire and other disturbance. We would conduct habitat treatments within the greater sage-grouse core area (as defined by Wyoming Executive Order 2011–5) in consultation with WGFD.



Smooth Brome

Wetlands

In artificial ponds, the refuge would manipulate water levels to mimic natural processes. In natural wetlands, the refuge would maintain and restore natural processes: (1) assess the effect of the Gros Ventre River irrigation diversion; (2) restore woody plant communities as appropriate; (3) restore beaver populations; (4) increase monitoring and control of invasive species; and (5) use prescribed fire and managed wildfire to mimic natural fire regimes.

Riparian Woodlands and Aspen Woodlands Areas

Management actions would be the same as alternative A. In addition, the refuge would emphasize the maintenance and restoration of natural processes. This would include water management designed to mimic natural flow patterns in Flat Creek and the Gros Ventre River; temporary construction of enclosures to support restoration of woody vegetation (but removal when restoration is complete), removal of historical enclosures, and elimination of the jack-straw willow demonstration project on Flat Creek. In addition, we would use prescribed fire and managed wildfire to mimic natural fire regimes in willow, cottonwood, and aspen stands.

Flat Creek Enhancement

Management actions would be the same as alternative A.

Invasive Species

Management actions would be the same as alternative B. In addition, the refuge would monitor and control invasive plants that are not now listed as noxious weeds (such as crested wheatgrass, reed canarygrass, meadow foxtail, cheatgrass, and yellow sweetclover) and restore native plant communities as possible.

Wildland Fire Management

Actions would vary depending on type of habitat.

Native Grasslands and Sagebrush Shrublands

To more represent historical conditions of vegetative structure and age, wildfires would be managed for multiple objectives including potential benefits. However, like Alternative A, there would still be an emphasis to protect mature, dense sagebrush stands from wildfires where feasible. Prescribed fire would be used for habitat management and hazardous fuels

reduction in both grasslands and sagebrush uplands. Prescribed fire treatments within the sage grouse core area (as defined by Wyoming Executive Order 2011-5) would be conducted in consultation with WGFD.

Wetlands

Wildland fire (both wildfire and prescribed fire) would be used in wetlands to mimic natural processes and reduce hazardous fuels.

Riparian Woodlands and Aspen Woodlands Areas

Prescribed fire and multiple objective wildfire will be used to mimic natural fire regimes and reduce hazardous fuels in willow, cottonwood, and aspen stands.

Wildlife

Important aspects of wildlife management would be maintaining long-distance ungulate migrations and a full suite of large native carnivores.

Elk and Bison

Management actions would be the same as alternative A.

Migratory Birds

Management actions would be the same as alternative A. In addition, the refuge would increase monitoring to establish baseline information on bird species using the refuge. We would use artificial methods, such as water structures, to mimic natural processes including natural flood regimes.

Aquatic Species

Management actions would be the same as alternative A. In addition, the refuge would work cooperatively with WGFD and water right holders to design and install screen devices that would help prevent moving nonnative fish species between distinct sub-drainages, especially between the Gros Ventre River and Flat Creek at the South Park diversion. The refuge would work cooperatively with WGFD to remove more nonnative fishes. We would also work with WGFD to start abundance surveys and population trend analysis for key native fish species (not trout) to be used as aquatic habitat health indicators.

Disease Management

Management actions would be the same as alternative A. In addition, the refuge would develop a

disease contingency plan, in coordination with WGF and Grand Teton National Park. The refuge would do more monitoring for wildlife disease.

Federally and State-Listed Species

Management actions would be the same as alternative A. In addition, the refuge would encourage maintenance and restoration of native plant communities and vegetative structure and composition that supports natural historical conditions.

Research and Monitoring

Management actions would be the same as alternative A. In addition, the refuge would emphasize research on the role of the refuge in the Greater Yellowstone Ecosystem. Research would be conducted to determine historical natural fire regimes, water regimes, and plant community composition and structure to evaluate and refine the refuge objectives.

Landscape-scale habitat protection research would be a high priority. This research would focus on the biological, social, and political responses to drivers of ecosystem change such as land use, invasive species, and climate change.

The refuge would evaluate the frequency and population status for groups of species for which little is known (invertebrates, small mammals, and bats).

We would increase all research and monitoring efforts to improve our confidence in the data.

Cultural Resources

Management actions would be the same as alternative B.

Visitor Services

Our visitor services would emphasize interpretative, educational, and outreach programs.

Hunting

Management actions would be the same as alternative A. In addition, the refuge would consider and create more hunting opportunities. As the need

arises, we would analyze and consider developing hunting opportunities for species other than elk and bison. We would open the currently closed areas on the southern and western boundaries of the refuge to archery hunters to protect critical winter forage for availability to elk later in the winter.

The refuge would require the use of lead-free ammunition while hunting on the refuge. Staff would develop regulations for proper storage of bear attractants and bear-deterrent practices and would require hunters to carry bear spray while hunting on the refuge. Staff would develop management tools for assessing hunter use—such as hunter checkpoints, hunter success surveys, and improved mandatory reporting of tag use—to better manage hunt program opportunities.

We would add access for archery hunters at the Jackson National Fish Hatchery. The refuge would explore the idea of providing bison hunters access to the northern end of the refuge through the Teton Valley Highlands subdivision to either hunter retrieval road 6 or 7.

Fishing

Management actions would be the same as alternative B. In addition, our management would emphasize healthy and abundant native fish species with an active and aggressive program to remove nonnative fishes. The refuge would evaluate the effects of nonnative fish species on native fish species and consider alternatives for the removal of nonnative fish.

Wildlife Observation and Photography

Management actions would be the same as alternative A. In addition, the refuge would add webcams on the refuge to provide offsite wildlife-viewing opportunities.

The refuge would impose limits on commercial wildlife-viewing tours, including the number of tour companies and number of vehicles, to reduce road congestion and wildlife disturbance.

We would increase the photos posted to an electronic media source to provide more wildlife-viewing opportunities. This photo collection would also help the staff with the many requests the refuge gets from publications, Web sites, communication specialists, the media, our regional and national Service offices, and other groups for photos of various events and scenery. The pictures are accompanied by interpretive text, photo credits, and information about when the photo was taken.

The refuge and the sleigh ride contractor would no longer promote Elk Refuge Road for viewing big-horn sheep.

Environmental Education and Interpretation

Management actions would be the same as alternative B, except the self-guided interpretive tour route would have fewer turnouts and signs to reduce habitat disturbance; disturbance would be limited to areas that include nonnative vegetation.

The refuge would offer climate change literature through various publications offered for sale by the Grand Teton Association. These efforts would be enhanced by adding literature generated by the U.S. Department of the Interior and our agency.

Jackson Hole and Greater Yellowstone Visitor Center

Management actions would be the same as alternative B.

Other Uses

Management of other uses would focus on limiting resource effects.

North Highway 89 Pathway

Management actions would be the same as alternative B.

North Park

Management actions would be the same as alternative B. In addition, the refuge would not renew the memorandum of understanding with the town of Jackson when it expires in 2015. Refuge staff would restore North Park to native habitat. We would develop a self-guided interpretive walk through the

area, explaining the types of plants and wildlife that use the area or similar habitat.

Special Use Permits

Management actions would be the same as alternative B. Also, staff would limit the number of special use permits for commercial wildlife-viewing tours to reduce traffic and other impacts on Elk Refuge Road

Access

Management actions would be the same as alternative B.

Public Outreach

Management actions would be the same as alternative B. In addition, outreach would emphasize the refuge's role in the Greater Yellowstone Ecosystem.

Visitor and Employee Safety and Resource Protection

Management actions would be the same as alternative B. In addition, we would consider land exchanges with adjacent Federal agencies.

Administration

To administer all aspects of the refuge, we rely on our Government-funded budget and the associated staff and facilities it supports. In addition, our partners often provide crucial support.

Funding and Staff

Management actions would be the same as alternative B. Also, we would hire three permanent seasonal interpretive naturalists to increase programs for the public, primarily at the visitor center. Programs would include (1) describing the needs and benefits of reintroducing large native predators to the Greater Yellowstone Ecosystem, (2) highlighting the nonwinter wildlife on the refuge, and (3) emphasizing the ecological functions and interrelationships found in the Greater Yellowstone Ecosystem. We would add 16.5 FTEs in new positions.

Facilities

Management actions would be the same as alternative B.



Lori Iverson / FWS

Mountain Bluebird

Elk Refuge Road

The refuge would work with Teton County to cease dust abatement on the road because treatment contains high salt levels that draw bighorn sheep.

The refuge would reduce the footprint of Elk Refuge Road and its turnouts to lessen ground disturbance and restore areas to native vegetation.

Partnerships

Management actions would be the same as alternative B. We would also prioritize partnerships that focus on special natural resource values of the Greater Yellowstone Ecosystem, such as long-distance migrations from there to the Yukon. Partners would help research landscape-scale activities and projects that might benefit wildlife traveling outside of this ecosystem, such as pronghorn or osprey.

3.8 Alternative D (Promote Natural Habitats and Balance Public Use)—Proposed Action

We would strike a balance between management activity and allowing natural processes and would identify priorities for research and monitoring between refuge and ecosystem because more public use would still require refuge-specific monitoring.

The proposed action represents balanced public use by providing some increase in developed areas while allowing other areas to remain undeveloped or to return to a natural state. Public use would emphasize outreach, interpretation, and education over recreation involving direct experiences.

Climate Change

Management actions would be the same as alternative C.

Landscape-Scale Conservation

Management actions would be the same as alternative C.

Habitat

Management would allow and use natural processes to promote natural habitats.

Native Grasslands and Sagebrush Shrublands

Management actions would be the same as alternative C.

Wetlands

Management actions would be the same as alternative B.

Riparian Woodlands and Aspen Woodlands Areas

Management actions would be the same as alternative B. In addition, the refuge would mimic the natural flow systems in Flat Creek and the Gros Ventre River. Artificial structures such as exclosures might be used to support efforts to restore native plant communities, but we would likely remove them on completion of restoration. Staff would remove the shelterbelt and associated exclosure in the headquarters management unit.

Flat Creek Enhancement

We would undertake a comprehensive restoration of a 3-mile reach of Flat Creek, immediately upstream of the confluence with Nowlin Creek, through the Flat Creek enhancement project. The project would be designed to improve aquatic habitat for native Snake River cutthroat trout (Biota 2013a, b). The purpose of the project is not to restore Flat Creek to presettlement form, but to enhance and stabilize the stream to meet the current demand by visitors, including anglers. We would restore channel form and function through (1) the removal of inappropriate instream structures and (2) the construction of stable channel morphology. In addition, we would remove infestations of reed canarygrass inside a 200-foot buffer on both sides of Flat Creek and revegetate with these areas with native species.

Specific goals of the Flat Creek enhancement project follow:

- Assess existing structures, tree revetments (streambank support), and other treatments for functionality and habitat values.
- Reduce hazards to anglers and wildlife.
- Remove, rehabilitate, or replace previously installed treatments with more suitable treatments.
- Improve channel dynamics and function.

- Specify appropriate stream habitat structures based on lessons learned from failed structures.
- Increase spawning, rearing, and juvenile habitat for native Snake River cutthroat trout.
- Construct appropriate stream morphology (based on hydrologic regime and sediment inputs) by improving stream processes and channel stability.
- Restore sediment transport continuity throughout the reach.
- Stabilize severe streambank erosion where it jeopardizes project success.
- Maintain conveyance for all expected discharge rates, including bankfull, 10-year, 50-year, and 100-year flows.
- Ensure appropriate floodplain connectivity at the bankfull discharge and stage.
- Provide for continued irrigation and diversion activities such that habitat enhancement and channel restoration activities are not jeopardized.
- Improve aesthetics and recreational opportunities.
- Map, treat, and control infestations of reed canarygrass.

Invasive Species

Management actions would be the same as alternative C.

Wildland Fire Management

Management actions would be the same as alternative C.

Wildlife

As in alternative C, the emphasis would be maintaining ungulate migrations and large native carnivores. An adaptive management approach would be used to evaluate hunting seasons on migratory elk.

Elk and Bison

Management actions would be the same as alternative A.

Migratory Birds

Management actions would be the same as alternative B.

Aquatic Species

Management actions would be the same as alternative A. In addition, the refuge would work cooperatively with WGFD and water right holders to design and install screen devices that would help prevent moving nonnative fish species between distinct sub-drainages, especially between the Gros Ventre River and Flat Creek at the South Park diversion. The refuge would work cooperatively with WGFD to remove more nonnative fishes.

Disease Management

Management actions would be the same as alternative C.

Federally and State-Listed Species

Management actions would be the same as alternative B.

Research and Monitoring

Management actions would be the same as alternative B.

Cultural Resources

Management actions would be the same as alternative B.

Visitor Services

Balanced public use would mean some increase in developed areas while allowing other areas to return to a natural state.

Hunting

Management actions would be the same as alternative B.

Fishing

Management actions would be the same as alternative B. In addition, the refuge would provide accessible opportunities for fishing.

Wildlife Observation and Photography

Management actions would be the same as alternative B. In addition, the refuge would impose limits on commercial wildlife-viewing tours, including the number of tour companies and number of vehicles, to reduce road congestion and wildlife disturbance.

Environmental Education and Interpretation

Management actions would be the same as alternative B.

Jackson Hole and Greater Yellowstone Visitor Center

Management actions would be the same as alternative B.

Other Uses

Management of other uses would focus on limiting resource effects.

North Highway 89 Pathway

Management actions would be the same as alternative B.

North Park

Management actions would be the same as alternative C.

Special Use Permits

Management actions would be the same as alternative C.

Access

Management actions would be the same as alternative B.

Public Outreach

Management actions would be the same as alternative B.

Visitor and Employee Safety and Resource Protection

Management actions would be the same as alternative C.

Administration

To perform our responsibility to administer all aspects of the refuge, we rely on our Government-funded budget and the associated staff and facilities it supports. In addition, our partners often provide crucial support.

Funding and Staff

Management actions would be the same as alternative C.

Facilities

Management actions would be the same as alternative B.

Elk Refuge Road

Management actions would be the same as alternative B, except we would not consider widening the road.

The refuge would reduce the footprint of Elk Refuge Road and its turnouts to lessen the ground disturbance and restore disturbed areas to native vegetation.

Partnerships

Management actions would be the same as alternative B.

3.9 Comparison of Alternatives and Consequences

Table 4 summarizes all aspects of management of the refuge under alternatives A–D. The actions are summarized from the above sections 3.5–3.8, and the consequences are described in full in chapter 5.

Table 4. Summary of the alternatives and their environmental consequences for the comprehensive conservation plan for the National Elk Refuge, Wyoming.

<i>Alternative A</i> (current management)— no action	<i>Alternative B</i> (enhance public use and intensive resource management)	<i>Alternative C</i> (emphasize intact ecosystems and promote natural processes)	<i>Alternative D</i> (promote natural habitats and balance public use)— proposed action
Climate change—actions			
<p>Conduct baseline monitoring.</p> <p>Rely on partners for climate change information, and use it to understand local impacts.</p> <p>Use efficiencies of the new irrigation system.</p> <p>Make facilities such as insulation, windows, and water heaters energy-efficient.</p> <p>Engage the public at the visitor center and provide climate change brochures.</p>	<p>Same as alternative A, plus:</p> <p>Cooperate with the Great Northern Landscape Conservation Cooperative to conduct research and monitoring.</p> <p>Carry out management where effects are identified, focusing on bison, elk, and Federal trust species.</p>	<p>Same as alternative B, plus:</p> <p>Focus management on natural processes such as fire, hydrology, and ungulate grazing.</p>	<p>Same as alternative C.</p>
Climate change—environmental consequences			
<p>Data would be obtained from other agencies and scientific organizations that monitor and predict the effects of climate change on wildlife, habitat, and ecosystem functions.</p> <p>Not collecting long-term climate change data on the refuge might result in important changes not being detected until there were adverse effects on refuge wildlife or habitats.</p> <p>Energy efficiency actions would lower the refuge’s carbon footprint, reduce costs and make more money available for other programs, and have no adverse effects on refuge work.</p> <p>Improved public understanding of climate change effects on natural resources would encourage support for adaptive resource management and mitigations.</p>	<p>Same as alternative A, plus:</p> <p>Involvement with the Great Northern Landscape Conservation Cooperative might provide fine-scale information that directly applies to the refuge, providing for better planning and management.</p> <p>More biological staff would be needed for the refuge to be involved in climate change data collection or analysis.</p>	<p>Same as alternative B, plus:</p> <p>A functioning natural ecosystem would result in resiliency, giving wildlife and plant communities the ability to respond to a disturbance or changing conditions.</p> <p>Limited money and staff time expended to achieve resiliency without the certainty of success.</p> <p>Meeting goals of the Bison and Elk Management Plan and some visitor services might be negatively affected if more money and staff were not added.</p>	<p>Same as alternative C.</p>

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Landscape-scale conservation—actions			
<p>Collaborate on land protection efforts with partners, and support appropriate off-refuge land protection projects.</p> <p>Participate in the Greater Yellowstone Coordinating Committee to coordinate management of Federal lands in the ecosystem.</p> <p>Coordinate with Teton County to review private land proposals that might adversely affect refuge resources.</p>	<p>Same as alternative A, plus:</p> <p>Consider partnerships to build wildlife crossings over Highway 89.</p>	<p>Same as alternative B, plus:</p> <p>Support land protection including protection of wildlife migration corridors.</p> <p>Expand the refuge acquisition boundary to the Twin Creek and Spring Gulch areas to maintain intact ecosystems.</p>	<p>Same as alternative C.</p>
Landscape-scale conservation—environmental consequences			
<p>Collaboration agencies and organizations would provide more resources for habitat protection that benefit refuge habitats and wildlife.</p> <p>Involvement with the Greater Yellowstone Coordinating Committee would provide information and assistance and resolve management controversies, helping leverage wildlife and habitat improvement on and around the refuge and promote public support of land management agencies.</p> <p>Partnerships would increase control of invasive plants across the landscape to keep the natural vegetation diversity, which benefits many wildlife species that rely on native plants for food and cover.</p>	<p>Same as alternative A, plus wildlife crossings could reduce collisions between vehicles and animals.</p>	<p>Same as alternative B, plus preserving wildlife migration corridors would increase genetic exchange between wildlife populations to improve the long-term survival of various wildlife in the ecosystem.</p> <p>Intact corridors could become avenues for the spread of invasive plants and might require increased control efforts.</p> <p>Strategic fee-title acquisition next to the refuge would provide opportunities to restore native plant communities and natural hydrology, increase forage, and reduce conflicts between wildlife and private landowners. This would support wildlife populations that disperse throughout the ecosystem during nonwinter months. However, the cost would be high and impractical based on current budgets.</p>	<p>Same as alternative C.</p>

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		<p>Restrictive easements obtained by private non-profit land trusts could complement management on the refuge.</p> <p>Emphasis on landscape-level projects would help ecosystem resiliency, but would divert money and staff time away from refuge-specific work.</p>	
<p>Habitat and Wildlife Goal—Adaptively manage bison, elk, and other wildlife populations and habitats as outlined in the Bison and Elk Management Plan. Contribute to the conservation of healthy native wildlife populations and their habitats. Restore and sustain a native fishery that provides quality fishing opportunities.</p>			
<p>Native grasslands and sagebrush shrublands—actions</p>			
<p>Control noxious weeds.</p> <p>Protect sagebrush shrublands and grasslands from degradation and allow areas to recover.</p> <p>Define desired characteristics of grasslands and sagebrush shrublands.</p> <p>Suppress all wildfires, do not manage for multiple objectives.</p> <p>Do not use prescribed fire as a management tool.</p>	<p>Same as alternative A, except:</p> <p>Carry out habitat projects with WGFD and the local greater sage-grouse working group.</p> <p>Introduce prescribed fire to enhance the quantity and quality of forage for elk and bison, reinvigorate native species, and to reduce hazardous fuels.</p>	<p>Same as alternative B, except:</p> <p>Emphasize vegetation age and structure representative of historical conditions. Use wildland fire to achieve desired conditions. Emphasize protecting mature, dense sagebrush stands from wildfires when feasible.</p> <p>Conduct habitat treatments in greater sage-grouse core areas in accordance with Wyoming Executive Order 2011–5.</p>	<p>Same as alternative C.</p>
<p>Native grasslands and sagebrush shrublands—environmental consequences</p>			
<p>There would be little transport of noxious weed seeds because of minimal vehicle traffic.</p> <p>Declines in open grassland and grassland patches in sagebrush stands would reduce habitat for birds that use these areas.</p> <p>Increases in older sagebrush stands would benefit birds that use these areas but have less use by elk and bison.</p>	<p>Same as alternative A, except:</p> <p>Native species composition would be maintained.</p> <p>More management would increase the risk of invasive plant infestation.</p> <p>Older sagebrush stands would be reduced compared to alternative A, so there would be less habitat for birds that depend on these areas, including less wintering habitat for greater sage-grouse.</p>	<p>Same as alternative A, plus:</p> <p>Effects from fire would be the same as alternative B except:</p> <ul style="list-style-type: none"> ■ Wildfires managed for benefits would more mimic natural fire occurrence and its effects on native species. 	<p>Same as alternative A, plus:</p> <p>Effects from fire would be the same as alternative C.</p>

Table 4. Summary of the alternatives and their environmental consequences for the comprehensive conservation plan for the National Elk Refuge, Wyoming.

<i>Alternative A</i> (current management)— no action	<i>Alternative B</i> (enhance public use and intensive resource management)	<i>Alternative C</i> (emphasize intact ecosystems and promote natural processes)	<i>Alternative D</i> (promote natural habitats and balance public use)— proposed action
<p>There would be increased wintering and nesting habitat for greater sage-grouse, but a decline in lek sites and brood-rearing habitat.</p> <p>There would be fewer changes to vegetative composition and structure for both resource management and hazard fuel reduction because wildland fire would not be used to manipulate them.</p>	<p>Young sagebrush and grass-dominated sites would increase and benefit birds that use these areas along with elk and bison.</p> <p>There would be decreased wintering and nesting habitat for greater sage-grouse, but an increase in lek sites and brood-rearing habitat.</p> <p>Costs and staff time would be higher than alternative A.</p> <p>Decadent stands of vegetation would be invigorated through the release of nutrients back into soil.</p> <p>Hazardous fuels would be reduced, leading to possible less costly and damaging wildfires.</p> <p>Prescribed fire may cause a temporary reduction in air quality but duration would be short.</p>	<ul style="list-style-type: none"> ■ Wildland fire may cause a temporary reduction in air quality, duration is expected to be of short. ■ Wildland fire to functioning more in its natural role could lead to reduced fire suppression and treatment costs. 	
Wetlands—actions			
<p>Maintain artificial ponds and natural wetlands for trumpeter swans and other wildlife.</p> <p>Continue the low level of monitoring and treatment of invasive species.</p> <p>Conduct limited prescribed burns.</p> <p>Suppress all wildfires, do not manage for multiple objectives.</p> <p>Do not use prescribed fire as a management tool.</p>	<p>Same as alternative A, plus: Improve water control capability in artificial ponds to enhance swan habitat.</p> <p>Construct managed ponds suitable to support nesting swans.</p> <p>Increase monitoring and control for invasive species in natural wetlands.</p> <p>Introduce prescribed fire to enhance the quantity and quality of forage for elk and bison, reinvigorate native species, and to reduce hazardous fuels.</p>	<p>Manipulate water levels in artificial ponds to mimic natural water processes.</p> <p>Assess the effects of the Gros Ventre River diversion on natural wetlands.</p> <p>Restore woody plant communities in natural wetlands.</p> <p>Restore beaver to natural wetlands.</p> <p>Increase monitoring and control for invasive species in natural wetlands.</p> <p>Use wildland fire to achieve desired conditions.</p>	<p>Same as alternative B, plus:</p> <p>Fire would be used the same as under alternative C.</p>

Table 4. Summary of the alternatives and their environmental consequences for the comprehensive conservation plan for the National Elk Refuge, Wyoming.

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Wetlands—environmental consequences			
<p>Manipulated water levels in artificial ponds would promote trumpeter swan habitat.</p> <p>Wetlands with more invasive species would be less valuable to native wildlife. Lack of prescribed fire would result in no change in use of these areas by elk and bison.</p> <p>There would be fewer changes to vegetative composition and structure for both resource management and hazard fuel reduction because wildland fire would not be used to manipulate them.</p>	<p>Improved water control structures and more ponds would increase habitat quality and quantity for trumpeter swans (more than the other alternatives). Costs and staff time would be much higher than alternative A and moderately higher than alternative C.</p> <p>The rate of spread of noxious weeds would be slower and the control of new invasive species would be much higher than alternative A (with lower long-term costs than alternative A).</p> <p>Prescribed burning would improve forage quality for elk and bison in wet meadows. Stands of vegetation would be invigorated through the release of nutrients back into soil. Costs and staff time would be substantially higher than alternative A and moderately higher than alternative C.</p> <p>Hazardous fuels would be reduced, leading to possible less costly and damaging wildfires.</p> <p>Prescribed fire would cause a temporary reduction in air quality but duration would be short.</p>	<p>Resulting water regimes would create swan habitat similar to alternative A, with less habitat than alternative B.</p> <p>The rate of spread of noxious weeds would be slower and the control of new invasive species would be much higher than alternative A (with lower long-term costs than alternative A).</p> <p>Wildland fire may improve forage quality for elk and bison in wet meadows more than alternative A but less than alternative B. Costs and staff time would be higher than alternative A and less than alternative B.</p> <p>Wildfires managed for benefits would more closely mimic natural fire occurrence and its effects on native species.</p> <p>Wildland fire may cause a temporary reduction in air quality, duration is expected to be of short.</p> <p>Wildland fire to functioning more in its natural role could lead to reduced fire suppression and treatment costs.</p> <p>Beaver ponds (refer to riparian woodlands and aspen woodlands) would increase open water in wet meadows and more long-term diversity.</p>	<p>Same as alternative B plus:</p> <p>Fire effects would be the same as under alternative C.</p>
Riparian woodlands and aspen woodlands—actions			
<p>Allow natural revegetation as ungulate populations allow.</p> <p>Evaluate restoration techniques along Flat Creek.</p>	<p>Same as alternative A, plus:</p> <p>Use water through irrigation efficiencies to improve riparian habitat.</p>	<p>Same as alternative A, plus:</p> <p>Use temporary exclosures to support restoration work.</p>	<p>Same as alternatives B and C.</p>

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<p>Cooperate with the National Park Service on Gros Ventre River hydrological assessment.</p> <p>Evaluate the jackstraw technique to promote willow regeneration.</p> <p>Suppress all wildfires, do not manage for multiple objectives.</p> <p>Do not use prescribed fire as a management tool.</p>	<p>Consider expanded willow regeneration techniques.</p> <p>Carry out recommendations from the Gros Ventre River hydrologic assessment.</p> <p>Fire actions same as under alternative A.</p>	<p>Eliminate the jackstraw willow regeneration project.</p> <p>Remove the shelterbelt and enclosure in the headquarters management unit. Explain to the public why this enclosure is not needed but in other areas they are needed.</p> <p>Mimic natural flow systems in Flat Creek and the Gros Ventre River.</p>	
Riparian woodlands and aspen woodlands—environmental consequences			
<p>With high levels of elk and bison browsing, the loss of woody plant community structure and change in some areas to grass-dominated communities would continue.</p> <p>Elk and bison densities would be slightly less than currently.</p> <p>Some cottonwood regeneration could occur in the Gros Ventre River riparian area.</p> <p>Costs and staff time would be slightly less than alternative B and substantially less than alternative C.</p> <p>Water diversion by private users would continue. Water levels and flow rates in Flat Creek and the Gros Ventre River would be similar to current conditions.</p> <p>Stream morphology would be similar to current conditions.</p>	<p>Same as alternative A, plus:</p> <p>Small-scale enclosures and jackstraw techniques to restore willow and cottonwood would restore only slightly more area than alternative A and much less area than alternative C.</p> <p>Costs and staff time would be slightly higher than alternative A and substantially less than alternative C.</p> <p>Fire effects same as under alternative A.</p> <p>If prescribed fire were allowed:</p> <p>Use would reduce hazardous fuels leading to reduced potential of costly and damaging wildfires.</p> <p>Use may assist in the restoration of riparian areas. Prescribed burning causes willows, aspen, and to a lesser extent cottonwood to re-sprout. Without enclosures, areas that have been prescribed burn are subject to heavy browsing by elk and bison.</p>	<p>Economic costs to private water users would be substantially higher than alternatives A and B.</p> <p>Allowing wildland fire to function more in its natural role could lead to reduced fire suppression and treatment costs</p> <p>The use of wildland fire would assist in the restoration of riparian areas. Fire causes willows, aspen, and to a lesser extent cottonwood to re-sprout. Without enclosures, areas that have been burned are subject to heavy browsing by elk and bison.</p> <p>Wildland fire may cause a temporary reduction in air quality. This reduction of air quality would generally be of longer duration and extent than grasslands, sagebrush, and wetland habitat types. Even though fuels within riparian habitat tend to be larger and burn for longer periods of time, smoke impacts are not anticipated to cause negative impact to the public.</p>	<p>Same as alternatives B and C.</p> <p>Fire effects would be the same as under alternative C.</p>

Table 4. Summary of the alternatives and their environmental consequences for the comprehensive conservation plan for the National Elk Refuge, Wyoming.

<i>Alternative A</i> (current management)— no action	<i>Alternative B</i> (enhance public use and intensive resource management)	<i>Alternative C</i> (emphasize intact ecosystems and promote natural processes)	<i>Alternative D</i> (promote natural habitats and balance public use)— proposed action
There would be fewer changes to vegetative composition and structure for both resource management and hazard fuel reduction because wildland fire would not be used to manipulate them. Not using prescribed fire would lead to no change in use by elk and bison.	Prescribed fire would cause a temporary reduction in air quality. This would generally be of longer duration and extent than grasslands, sagebrush, and wetland habitat types. Even though fuels within riparian habitat tend to be larger and burn for longer periods of time, smoke impacts are not anticipated to cause negative impact to the public.		
Flat Creek enhancement—actions			
Monitor 1 mile of construction work on Flat Creek and removal of reed canarygrass that was completed in 2013.	Same as alternative A.	Same as alternative A.	Same as alternative A, plus: Carry out the Flat Creek enhancement project to restore channel form and function over 3 stream miles through removal of inappropriate instream structures and construction of stable channel morphology. Remove reed canarygrass infestations along the creek and revegetate with native species.
Flat Creek enhancement—environmental consequences			
Based on monitoring results, we would use adaptive management strategies as needed to increase ecological benefits and better achieve objectives.	Same as alternative A.	Same as alternative A.	Same as alternative A, plus: The Flat Creek enhancement project would reduce sediment inputs to the watershed, improve stream processes, and increase habitat for all age classes of Snake River cutthroat trout. Stable streambanks would be vegetated with native species.
Invasive species—actions			
Use integrated pest management (biological control, mechanical control, grazing, and herbicides).	Same as alternative A, plus: Increase monitoring and rapid response for new infestations.	Same as alternative B, plus: Monitor and remove invasive plants that are not listed as noxious weeds.	Same as alternative C.

Table 4. Summary of the alternatives and their environmental consequences for the comprehensive conservation plan for the National Elk Refuge, Wyoming.

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<p>Prevent transportation of invasive plant seeds onto the refuge through public education, weed-free-hay rules, and equipment cleaning.</p> <p>Continue limited monitoring.</p>	<p>Develop large-scale invasive plant eradication programs.</p>		
Invasive species—environmental consequences			
<p>Native plant communities would be protected and new infestations of invasive species prevented.</p> <p>Control work would contain an infestation, but it could not address large infestations.</p> <p>There would be a moderate increase in distribution and density of weed species in wetlands but less risk of new infestations because of limited vehicle traffic.</p> <p>Unlikely to make early detection of aquatic invasive species like zebra mussel because of limited monitoring.</p>	<p>Same as alternative A, plus:</p> <p>Locating and treating new infestations would be the best and most cost-effective way to fight the spread of invasive plants.</p> <p>Large-scale eradication would be more effective over the long term, but it would be more expensive and put more herbicide into the environment in the short term.</p> <p>Costs would increase in the short term over alternative A but be lower in the long term.</p>	<p>Same as alternative B, plus:</p> <p>Dealing with additional invasive species would be expensive and take many years of effort to carry out.</p> <p>Costs would be higher.</p>	<p>Same as alternative C.</p>
Elk and bison—actions and environmental consequences			
<p>We will carry out the refuge-specific management actions from the Bison and Elk Management Plan, where the effects of the actions were analyzed and described. We also developed complementary, specific actions, described in the habitats below.</p>			
Migratory birds—actions			
<p>Maintain areas closed to public access during the bird breeding season.</p>	<p>Same as alternative A, plus:</p> <p>Increase monitoring to establish baseline information on bird species using the refuge.</p>	<p>Same as alternative A, plus:</p> <p>Increase monitoring to establish baseline information on bird species using the refuge.</p> <p>Use water control structures to mimic natural processes such as typical periods of high and low water.</p>	<p>Same as alternative B.</p>

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Migratory birds—environmental consequences			
<p>Overall diversity of migratory birds would be relatively low.</p> <p>Birds that depend on old, dense, sagebrush stands would have more habitat.</p> <p>Birds that depend on open grasslands and young sagebrush would have less habitat.</p> <p>There would be no change in habitat for wetland-dependent birds.</p> <p>Birds that depend on willow, cottonwood, and aspen stands would have less habitat.</p>	<p>Same as alternative A, plus:</p> <p>Diversity of migratory birds would be slightly higher than alternative A.</p> <p>Birds that depend on open grasslands and young sagebrush would benefit from more use of fire to create habitat.</p> <p>There would be less nesting cover for migratory birds in wet meadows.</p> <p>Costs and staff time for monitoring would be much higher than alternative A.</p>	<p>Same as alternative A, plus:</p> <p>Improved habitat quality would result in the highest diversity of migratory birds.</p> <p>Birds using wet meadows would have nesting cover intermediate between alternatives A and B.</p> <p>Increased diversity of wetland communities on southern end of the refuge would increase habitat for shrub-nesting birds compared to alternatives A and B.</p> <p>Birds dependent on riparian woodlands and aspen woodlands and woodlands would have 500–1,000 acres more of willow, 100 acres more of cottonwood, and 1,000 acres more of aspen.</p> <p>Costs and staff time for monitoring would be higher than alternative A and similar to alternative B.</p>	<p>Same as alternative B.</p>
Aquatic species—actions			
<p>Work with WGFD for fisheries services including abundance, spawning, and harvest surveys. Focus surveys on Snake River cutthroat trout.</p> <p>Target nonnative brook trout in Flat Creek for removal.</p>	<p>Same as alternative A.</p>	<p>Same as alternative A, plus:</p> <p>Work with WGFD and water right holders to install fish screens to keep nonnative fishes from moving between the Gros Ventre River and Flat Creek at the South Park diversion.</p> <p>Work with WGFD to remove more nonnative fishes.</p> <p>Work with WGFD to do abundance surveys and population trend analysis for key native fish species.</p>	<p>Same as alternative A, plus:</p> <p>Work with WGFD and water right holders to install fish screens to keep nonnative fishes from moving between the Gros Ventre River and Flat Creek at the South Park diversion.</p> <p>Work with WGFD to remove more nonnative fishes.</p>

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Aquatic species—environmental consequences			
<p>Basic knowledge of native trout populations would allow for effective fishery and harvest management.</p> <p>Working with WGFD would reduce refuge costs and ensure alignment with WGFD objectives and regulations.</p> <p>Native trout would have less competition from non-native species for food and habitat resources if removal efforts could substantially reduce nonnative trout populations.</p> <p>Counting the nonnative trout removed would provide data for long-term population trends.</p> <p>Some anglers view nonnative trout removals as less fishing opportunity and a waste of money.</p> <p>Amphibian habitat quantity, quality, and distribution would be the same.</p>	<p>Same as alternative A, plus:</p> <p>New artificial ponds would result in a net increase in amphibian habitat compared to alternative A.</p>	<p>Same as alternative A, plus:</p> <p>Screens would decrease the introduction of nonnative trout into Flat Creek. Screens would have a high initial cost and would likely increase maintenance costs for the refuge, WGFD, and water rights holders.</p> <p>Increased removal of non-native trout would benefit native fish and invertebrates. More removal would increase WGFD costs and further reduce fishing opportunities.</p> <p>Information about unharvested species could lead to enhanced aquatic habitat. A new program would increase WGFD staff costs, do little to improve the native trout fishery, and might be viewed as being too expensive.</p> <p>More beaver ponds would increase amphibian habitat more than alternative A and comparable to alternative B.</p>	<p>Same as alternative A, plus:</p> <p>Screens would decrease the introduction of nonnative trout into Flat Creek. Screens would have a high initial cost would likely increase maintenance costs for the refuge, WGFD, and water rights holders.</p> <p>Increased removal of non-native trout would benefit native fish and invertebrates. More removal would increase WGFD costs and further reduce fishing opportunities.</p>
Disease management—actions			
<p>Carry out disease management actions in the Bison and Elk Management Plan.</p> <p>Monitor amphibian populations for chytrid disease.</p> <p>Coordinate with WGFD to detect sick bighorn sheep.</p> <p>Concentrate elk and bison on the refuge during February and March to reduce transmission of brucellosis.</p>	<p>Same as alternative A, plus:</p> <p>Develop a comprehensive disease contingency plan.</p>	<p>Same as alternative A, plus:</p> <p>Develop a disease contingency plan with WGFD and Grand Teton National Park. Do more monitoring for disease.</p>	<p>Same as alternative C.</p>

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Complete a contingency plan for chronic wasting disease and cooperate with WGFD on monitoring for the disease.			
Disease management—environmental consequences			
<p>There would be less risk of brucellosis transmission from elk and bison to cattle because the feeding process reduces the likelihood of mixing the wild and domestic herds.</p> <p>High herd densities of elk and bison on the southern end of the refuge would increase their disease risk.</p> <p>Monitoring of diseases would be insufficient to detect early outbreaks, including in bird populations.</p> <p>Monitoring would allow early detection of disease in amphibian and bighorn sheep populations.</p>	<p>Same as alternative A, plus:</p> <p>The risk of density-dependent disease in elk and bison herds would be the lowest of the alternatives.</p> <p>The contingency plan would result in more monitoring and the refuge having a better ability to respond to disease outbreaks.</p> <p>Cost and staff time would be higher than alternative A.</p>	<p>Same as alternative A, plus:</p> <p>No intervention for native disease outbreaks might result in negative effects on populations and negative public relations for letting animals die.</p> <p>In spite of more monitoring, the lack of response to all disease outbreaks would not reduce the effects of disease on wildlife populations.</p> <p>Cost and staff time would be higher than alternative A and less than alternative B.</p>	<p>Same as alternative C.</p>
Federally and State-listed species—actions			
<p>Monitor greater sage-grouse, trumpeter swan, and long-billed curlew populations.</p> <p>Maintain areas closed to public access to prevent disturbance of species of concern.</p> <p>Coordinate with WGFD and the local greater sage-grouse working group on greater sage-grouse core area strategy for refuge activities.</p> <p>Based on monitoring, possibly limit management activities in trumpeter swan and long-billed curlew breeding areas.</p>	<p>Same as alternative A, plus:</p> <p>With WGFD, increase monitoring of other State species of greatest conservation need.</p> <p>Support recovery plan goals for federally listed species where not in conflict with the Bison and Elk Management Plan.</p> <p>Enhance swan habitat to meet population objectives of the Trumpeter Swan Management Plan and increase nesting in areas visible to the public.</p>	<p>Same as alternative A, plus:</p> <p>Maintain and restore native plant communities with vegetative structure and composition that supports natural historical conditions.</p>	<p>Same as alternative C.</p>

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Limit refuge activities as to prevent unnecessary disturbance of threatened and endangered species.			
Federally and State-listed species—environmental consequences			
<p>Detection of population changes for only greater sage-grouse, trumpeter swan, and long-billed curlew would be likely.</p> <p>Greater sage-grouse wintering and nesting habitat would increase over time but lek and brood rearing habitat would decline. This alternative would have the greatest potential to support greater sage-grouse.</p> <p>Trumpeter swan productivity would be similar to current.</p>	<p>Same as alternative A, plus:</p> <p>Detection of status changes in more Wyoming species of conservation need would be likely. Monitoring costs and staff time would be substantially higher than alternative A.</p> <p>Decreased mature sagebrush stands would reduce greater sage-grouse winter habitat. This alternative would have the lowest potential to benefit greater sage-grouse.</p> <p>Wetland improvements and egg rescue would result in the highest productivity of trumpeter swan and likelihood of meeting nesting objectives.</p>	<p>Same as alternative A, plus:</p> <p>Detection of status changes in more Wyoming species of conservation need would be likely. Monitoring costs and staff time would be substantially higher than alternative A.</p> <p>Less burning would protect dense, mature sagebrush stands and result in greater sage-grouse wintering habitat comparable to alternative A.</p> <p>Trumpeter swan productivity would be slightly lower than alternative A and substantially lower than alternative B.</p>	Same as alternative C.
Research and monitoring—actions			
<p>Monitor whether we are meeting the objectives of the Bison and Elk Management Plan.</p> <p>Rely on other agency and nonprofit partners to conduct some monitoring.</p> <p>Gather population data for Federal threatened and endangered species and State species of concern.</p> <p>Develop modeling and decision-support tools.</p> <p>Determine the effects of public use and other refuge programs on habitat and wildlife.</p>	<p>Same as alternative A, plus:</p> <p>Increase monitoring of public use and other refuge programs on habitat and wildlife.</p> <p>Increase all research and monitoring efforts to improve confidence in data.</p>	<p>Same as alternative A, plus:</p> <p>Emphasize the role of the refuge in the Greater Yellowstone Ecosystem and determine natural processes.</p> <p>Focus research on landscape-scale habitat protection.</p> <p>Increase all research and monitoring efforts to improve confidence in data.</p> <p>Evaluate population status for species about which little is known, such as invertebrates and small mammals.</p>	Same as alternative B.

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Research and monitoring—environmental consequences			
<p>Get data about only the highest biological priorities.</p> <p>Marginal confidence levels in data would provide limited information.</p> <p>Researchers and marked animals would be a short-duration detraction from quality wildlife observation.</p>	<p>Same as alternative A, plus:</p> <p>More information would be available about the effects of public use on wildlife and habitats.</p> <p>Increased confidence in data might result in better management decisions.</p> <p>Cost and staff time would be higher than alternative A.</p> <p>With more activity, researchers and marked animals would have a greater effect than alternative A on visitors during wildlife observation.</p>	<p>Same as alternative B, plus:</p> <p>More data would be available about the refuge within the ecosystem.</p> <p>Cost and staff time would be higher than alternative A and comparable to alternative B.</p>	<p>Same as alternative B.</p>
Cultural Resources Goal—Preserve and interpret cultural resources in a way that allows visitors to connect to the area’s rich history and conservation heritage.			
Cultural resources—actions			
<p>Protect cultural resources.</p> <p>Identify cultural resources through archaeological surveys before ground disturbance.</p> <p>Prohibit public access to known archaeological sites.</p> <p>Open the historic Miller Ranch seasonally to the public for interpretation and rely solely on volunteers to staff and run it.</p>	<p>Same as alternative A, plus:</p> <p>Develop a walking interpretive trail around Miller Ranch.</p> <p>Work with partners to stabilize structural problems on the Miller Barn and use it for interpretation.</p> <p>Restore other Miller Ranch buildings as needed.</p> <p>Seek money for interpreters at Miller House.</p>	<p>Same as alternative B.</p>	<p>Same as alternative B.</p>
Cultural resources—environmental consequences			
<p>Cultural resources would be protected from vandalism and theft.</p> <p>Preconstruction resource inventories and assessments would protect any archaeological resources and reduce the probability of a costly work stoppage.</p>	<p>Same as alternative A, plus:</p> <p>Visitors could learn about the historic value of the Miller Ranch when walking the interpretive trail.</p> <p>Construction of the trail and installation of signs would disturb some soil and vegetation.</p>	<p>Same as alternative B.</p>	<p>Same as alternative B.</p>

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<p>Limiting access to known archaeological sites would reduce site disturbance and loss of artifacts.</p> <p>The public could visit and learn about the historic Miller Ranch in summer. Reduced hours due to lack of staff would reduce visitor opportunities as well as revenue from items sold by the Grand Teton Association. The Miller Barn would continue to deteriorate without money for restoration.</p>	<p>Use of the trail might put visitors nearer closed areas and result in trespass that disturbs waterfowl.</p> <p>The historic Miller Barn would be restored in cooperation with partners and retain its historical value as well as providing another interpretive facility.</p> <p>Visitors to Miller Ranch would receive enhanced programs provided by permanent or seasonal interpreters.</p>		
Visitor Services Goal —Enable a diverse audience to understand and appreciate the refuge’s wildlife conservation role in Jackson Hole, while safely enjoying year-round opportunities for wildlife-dependent recreation.			
Hunting—actions			
<p>Provide elk and bison hunting consistent with the Bison and Elk Management Plan.</p> <p>Adaptively revise elk and bison hunting regulations to achieve herd size objectives.</p> <p>Accommodate hunters with disabilities and offer a special elk hunt for young people.</p> <p>Promote voluntary use of lead-free ammunition.</p> <p>Allow game retrieval from the national forest through the refuge.</p> <p>Allow a ceremonial tribal hunt of bison (up to five bison per year).</p> <p>Prohibit hunting of any wildlife other than elk and bison.</p>	<p>Same as alternative A, plus:</p> <p>Expand hunting opportunities for young people, and develop a hunter mentoring program.</p> <p>Consider adding a committed refuge hunting opportunity and a bull elk hunt.</p> <p>Pursue access for bison hunters to the northern end of the refuge through the Teton Valley Highlands subdivision.</p> <p>Develop regulations for storage of bear attractants and bear-deterrent practices and encourage carry of bear spray.</p> <p>Conduct hunter checkpoints, surveys, and mandatory reporting of tag use to better manage hunting.</p>	<p>Same as alternative A, plus:</p> <p>Open the closed area on the southern and western end of the refuge to archery hunting. Add archery hunter access at the Jackson National Fish Hatchery.</p> <p>Create bison hunter access to the northern end of the refuge through the Teton Valley Highlands subdivision.</p> <p>Require the use of lead-free ammunition.</p> <p>Develop regulations for storage of bear attractants and bear-deterrent practices and require carry of bear spray.</p> <p>Conduct hunter checkpoints, surveys, and mandatory reporting of tag use to better manage hunting.</p>	<p>Same as alternative B.</p>

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Allow guided hunting under special use permit to increase harvest success to support herd size objectives.	Consider hunting of species other than elk and bison to address management needs.	Consider hunting of species other than elk and bison to address management needs.	
Hunting—environmental consequences			
<p>There would be insufficient harvest to meet objectives of the Bison and Elk Management Plan.</p> <p>Easier retrieval would encourage more hunting.</p> <p>Scavenging birds would be at risk of lead poisoning, because more than 60% of hunters would not use lead-free ammunition.</p> <p>Hunters with disabilities and young hunters would take advantage of special programs.</p> <p>American Indians would continue their ceremonial hunt.</p>	<p>Same as alternative A, plus:</p> <p>More opportunities could increase the number of nonlocal hunters.</p> <p>Opening closed areas would keep elk from building up in areas where they would be less susceptible to harvest.</p> <p>More access for bison hunters could increase harvest and help meet herd objectives. Subdivision residents might not support increased traffic.</p> <p>More elk and bison use in improved habitat would increase hunter opportunity and the likelihood of meeting elk and bison population objectives.</p> <p>More young people would be attracted to better hunting during mid-season of the regular hunt. Adult hunters might have less opportunity at this time.</p> <p>Nonhunters might be alienated because of more visible harvest in opened areas near Jackson, a bull elk harvest, and a predator harvest. Elk-viewing opportunities might decrease along Highway 89.</p> <p>Requiring bear spray could provide a safer environment for hunters, communities, and bears but would increase cost to hunters.</p>	<p>Same as alternative A, plus:</p> <p>More opportunities could increase the number of nonlocal hunters.</p> <p>Opening closed areas would keep elk from building up in areas where they would be less susceptible to harvest.</p> <p>More access for bison hunters could increase harvest and help meet herd objectives. Subdivision residents might not support increased traffic.</p> <p>Elk and bison use, intermediate between alternatives A and B, in improved habitat would increase hunter opportunity and the likelihood of meeting elk and bison population objectives.</p> <p>Nonhunters might be alienated because of more visible harvest in opened areas near Jackson, a bull elk harvest, and a predator harvest. Elk-viewing opportunities might decrease along Highway 89.</p> <p>Requiring bear spray could provide a safer environment for hunters, communities, and bears but would increase cost to hunters.</p> <p>Requiring lead-free ammunition would protect scavenging birds from lead poisoning but would increase cost to hunters.</p>	<p>Same as alternative B.</p>

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	<p>There would be better data for managing hunts and increasing harvest.</p> <p>Outreach about hunting would educate the public on the need and purpose for this recreational activity.</p> <p>There would be higher equipment costs and more labor needed.</p>	<p>There would be better data for managing hunts and increasing harvest.</p> <p>Outreach about hunting would educate the public on the need and purpose for this recreational activity.</p> <p>There would be higher equipment costs and more labor needed.</p>	
Fishing—actions			
<p>Provide fishing during daylight hours.</p> <p>Maintain fishing access along Highway 89 and parking turnouts on upper Flat Creek.</p> <p>According to seasons and regulations set by WGF, open these areas to fishing: Gros Ventre River, upper Flat Creek, and Sleeping Indian Pond.</p> <p>Close these areas to fishing: all other refuge ponds, Flat Creek downstream from the old Crawford Bridge site, and Nowlin Creek upstream from the posted fishing boundary.</p> <p>Issue special use permits for guided fishing on Flat Creek only.</p>	<p>Same as alternative A, plus:</p> <p>Sponsor Kids' Fishing Day with Jackson National Fish Hatchery and WGF.</p> <p>Develop a fishing program for young people including a mentoring program.</p> <p>Open gates to lower Flat Creek at daylight on opening day to maintain the daylight-only fishing restriction.</p> <p>Construct accessible fishing platform on Flat Creek.</p> <p>Allow guided fishing under special use permit on lower Flat Creek only.</p> <p>Increase habitat and water-flow management for increased fishing opportunity for native fishes.</p> <p>Enhance fisheries with fish screens to help native species in Gros Ventre River.</p>	<p>Same as alternative B, plus:</p> <p>Provide more support for native fish species.</p> <p>Do aggressive removal of nonnative fishes.</p>	<p>Same as alternative B, plus:</p> <p>Provide accessible opportunities for fishing.</p>
Fishing—environmental consequences			
<p>Stream morphology, fisheries habitat, access, and angler opportunity would be similar to current conditions.</p>	<p>Same as alternative A, plus:</p> <p>More young people would be exposed to fishing, and these programs would take more staff time.</p>	<p>Same as alternative B, plus:</p>	<p>Same as alternative B, plus:</p>

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<p>Areas closed to fishing would protect waterfowl breeding areas, specifically trumpeter swan nest sites.</p>	<p>Opening the Flat Creek access gates at daylight on August 1 would be consistent with refuge regulations.</p> <p>More people would be able to reach Flat Creek to fish off an accessible platform.</p> <p>Charging a fee and restricting the number of permits for guided fishing would strengthen the enforceability of permits and reduce crowding. Fees might impact the outfitters.</p> <p>Fish screens on the Gros Ventre River might prevent migration of rainbow trout into the Flat Creek cut-throat population.</p> <p>Fisheries habitat improvement and angler opportunity in Flat Creek would be greater than alternative A and similar to alternative A in the Gros Ventre River.</p>	<p>Because of riparian area improvement, the fisheries habitat quantity and quality and angler opportunity would be the highest among the alternatives in the Gros Ventre River. In Flat Creek, these effects would be similar to alternative A</p>	<p>Because of riparian area improvement, the fisheries habitat quality and quantity and angler opportunity would be higher in Flat Creek than alternatives A and C. In the Gros Ventre River, these effects would be similar to alternative A and lower than alternative C.</p>
Wildlife observation and photography—actions			
<p>Maintain access to turnouts, trails, and other observation sites including these primary sites:</p> <ul style="list-style-type: none"> ■ visitor center viewing platform ■ Burt Raynes Boardwalk and remote-viewing platform ■ turnout north of the visitor center ■ elk jump turnout on Highway 89 ■ North Highway 89 Pathway <p>Open Elk Refuge Road and Flat Creek Road May 1–November 30.</p>	<p>Same as alternative A, plus: Develop trail pulloffs along the North Highway 89 Pathway.</p> <p>Develop a prominent accessible access route from the visitor center to the existing remote-viewing platform.</p> <p>Develop an accessible boardwalk with a photo blind through disturbed wetlands near the visitor center.</p> <p>Use webcams for wildlife-viewing opportunities such as watching swans nesting. Develop a wildlife checklist.</p>	<p>Same as alternative A, plus:</p> <p>Set limits for commercial wildlife-viewing companies.</p> <p>Use webcams for wildlife-viewing opportunities including watching swans nesting.</p> <p>Expand the photo gallery on the refuge Web site.</p>	<p>Same as alternative B, plus:</p> <p>Set limits for commercial wildlife-viewing companies.</p>

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<p>Open 3.5 miles of Elk Refuge Road for winter wildlife observation December 1–April 30.</p> <p>Allow wildlife-touring companies to operate through special use permit.</p> <p>Continue contracted sleigh rides.</p> <p>Use Web-based photo-sharing sites for refuge photos.</p>			
Wildlife observation and photography—environmental consequences			
<p>Local and nonlocal visitors would use existing facilities to observe wildlife and take photos.</p> <p>Effects on wildlife would be minimal because visitor use would be limited to areas that are already disturbed.</p> <p>User conflicts on the narrow North Highway 89 Pathway could continue.</p> <p>Use of the remote-viewing platform would be low, because visitors would continue to be hesitant about crossing the visitor center lawn to access the platform.</p> <p>People unable to visit the refuge could still enjoy views of the scenery and wildlife through a refuge photo gallery.</p> <p>Visitors would have opportunities for wildlife-viewing on commercial tours. Permit stipulations would ensure safe operations and reduce effects to wildlife.</p>	<p>Same as alternative A, plus: With new trail pulloffs along the North Highway 89 Pathway, there would be fewer conflicts among users.</p> <p>More visitors would use the viewing platform at the visitor center via the new path across the lawn. Construction could temporarily affect wetlands and soil. Use of the path might disturb nesting geese on the lawn:</p> <p>The new boardwalk would enhance the visitor experience with a longer walk for observation, and photographers could use a photo blind. Construction and maintenance would disturb wildlife for short periods. Cost would be substantial.</p> <p>Webcams would let people enjoy the refuge without having to be onsite. There would be minor soil effects for installation and maintenance. Technical support for webcam malfunctions may not be available.</p>	<p>Same as alternative A, plus:</p> <p>Limiting tour companies would reduce traffic congestion and wildlife disturbance.</p> <p>Enforcing limited tour companies would increase costs. Demand for tours would not be met. There could be reduced income for some tour companies.</p> <p>Web cams would let people enjoy the refuge without having to be onsite. There would be minor soil effects for installation and maintenance.</p>	<p>Same as alternative B, plus:</p> <p>Limiting tour companies would reduce traffic congestion and wildlife disturbance.</p> <p>Enforcing limited tour companies would increase costs. Demand for tours would not be met. There could be reduced income for some tour companies.</p>

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<p>Contracted sleigh rides would provide unique viewing opportunities while reducing stress to wintering wildlife, particularly elk:</p> <ul style="list-style-type: none"> ■ Some of the money would return to the refuge and be used to hire winter naturalists who would provide school and other programs. ■ Increased visitation would contribute to the local sales tax revenue. ■ The public and media would get refuge photos from a Web site, reducing staff time on requests. 			
Environmental education and interpretation—actions			
<p>Provide education programs with nongovernment-funded winter-season naturalists to meet demand during the school year.</p> <p>Offer spring and summer programs with local or residential volunteers when possible.</p> <p>Continue contracted sleigh rides.</p> <p>Assess and replace as needed aging and outdated refuge signs.</p>	<p>Continue contracted sleigh rides.</p> <p>Use the North Highway 89 Pathway to interpret wetland values and other messages.</p> <p>Develop a self-guided, interpretive tour route on Elk Refuge Road.</p> <p>Assess visitor preferences and update the current refuge video or produce shorter videos.</p> <p>Stabilize and restore Miller Barn for use as an interpretive site.</p> <p>Offer improved programs at the visitor center, Miller House, and offsite areas with more permanent or seasonal interpreters.</p>	<p>Same as alternative B, except:</p> <p>Reduce turnouts and signs along the interpretive tour route.</p> <p>Limit disturbance to areas with nonnative vegetation.</p>	<p>Same as alternative B.</p>

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	<p>Promote understanding of invasive species control and prescribed fire as a management tool.</p> <p>Increase public education about refuge's migratory bird use and why areas are closed during breeding.</p>		
Environmental education and interpretation—environmental consequences			
<p>Nonmotorized use of North Highway 89 Pathway would increase opportunities for environmental education and interpretation.</p> <p>Seasonal naturalists, as many as unpredictable amounts of private money would fund, would provide programs in schools.</p> <p>Volunteers, as available, would provide service to visitors at the visitor center and present education and interpretation programs.</p> <p>Using volunteers is not a stable workforce because of the small local population to draw from, lack of housing for nonlocal volunteers, and need for continual training of new people that work limited hours.</p> <p>Contracted sleigh rides would provide unique learning opportunities and reduce stress to wintering wildlife, particularly elk.</p>	<p>Visitors could learn about the refuge resources through interpretation at pulloffs along the North Highway 89 Pathway and along the Elk Refuge Road interpretive tour route.</p> <p>Visitor center videos would engage visitors and explain the different roles of national wildlife refuges, national parks, and national forests and describe the Greater Yellowstone Ecosystem.</p> <p>People would learn more about the refuge through contacts with an increased permanent staff.</p> <p>Costs would be higher for more staff and interpretive materials.</p>	<p>Same as alternative B, except:</p> <p>Disturbance would be limited to areas that include nonnative vegetation.</p>	<p>Same as alternative B.</p>
Visitor center—actions			
<p>Pay most operational and maintenance costs for the multi-agency visitor center and staff with one full-time visitor center manager.</p> <p>Partner agencies provide minimal staff at the information desk.</p>	<p>Use partner contributions to help with visitor center operations.</p> <p>Document and evaluate the building condition and maintenance issues.</p>	<p>Same as alternative B.</p>	<p>Same as alternative B.</p>

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	Rehabilitate, expand, remodel, or replace the existing building or build a new visitor center.		
Visitor center—environmental consequences			
<p>The visitor center would remain open but might have reduced hours because of lack of money and staff.</p> <p>Reduced hours would limit public services and lower revenue at Grand Teton Association’s sales outlet.</p> <p>Visitors would not have opportunities to learn about the refuge because the visitor center manager would not have time to develop adequate programs.</p>	<p>A fully operational visitor center would be adequately staffed and maintained.</p> <p>A new visitor center would enhance the flow of visitors in the center, provide information and interpretation, and address safety issues and accessibility deficiencies.</p>	Same as alternative B.	Same as alternative B.
North Highway 89 Pathway—actions			
<p>Allow nonmotorized and pedestrian use.</p> <p>Prohibit pets and horses. Continue to close the pathway seasonally from November 1 through April 30.</p>	<p>Same as alternative A, plus:</p> <p>Use during the open season for resource interpretation.</p> <p>Work with county to evaluate pathway effects on habitat and wildlife, adjust seasonal use as needed.</p> <p>Apply criteria and determine yearly whether to open the pathway as early as April 15 when spring arrives unusually early.</p>	Same as alternative B.	Same as alternative B.
North Highway 89 Pathway—environmental consequences			
<p>Public would have opportunities for wildlife observation and photography.</p> <p>Prohibiting pets and horses would limit disturbance to wildlife, particularly nesting waterfowl and other birds adjacent to pathway.</p> <p>The seasonal closure would protect elk migration corridors and prevent disturbance to wintering elk and other wildlife.</p>	<p>Same as alternative A, plus:</p> <p>People on the pathway would have access to an interpretive experience.</p> <p>There would be added staff time and costs for signage and facilities.</p> <p>Data on wildlife movement across the pathway would help the refuge adjust use as needed to protect wildlife and keep people safe.</p>	Same as alternative B.	Same as alternative B.

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Regulations would be enforced by Teton County with a substantial public outreach effort by staff.			
North Park—actions			
Continue the partnership with Jackson to manage North Park under the current memorandum of understanding, including reservations and fee collection.	Continue the partnership with Jackson to manage North Park and revise the memorandum of understanding to do away with the reservation and fee collection system for the picnic shelter.	Same as alternative B, plus: Let the memorandum expire in 2015 and do not renew it. Restore native habitat and provide an interpretive nature walk.	Same as alternative B.
North Park—environmental consequences			
The reservation and fee collection system for the picnic shelter would not comply with agency policy. Weddings would be common and could reduce parking for refuge visitors.	There would no longer be a reservation system, which would comply with policy. Some of the public might be unhappy about not being able to reserve the picnic shelter. Jackson would lose revenue from the refuge picnic shelter but that might be offset by more reservations within the town limits.	Same as alternative B, plus: Interpretation in a more natural setting would add to visitors' experiences. More native habitat would increase the habitat value for most breeding birds, except Canada geese. There would be initial costs to restore North Park to native habitat.	Same as alternative B.
Special uses—actions			
Issue special use permits for guided hunting and fishing, hunting retrieval services, commercial wildlife-viewing tours, professional photography and videography, and research. Include special conditions in special use permits to reduce effects on the resources and other activities. Decide on an individual basis if access would be allowed in closed areas. Deny requests to hold weddings at the Miller House. Prohibit precedent-setting special access requests that would be difficult to manage.	Same as alternative A, except: Charge fees when issuing special use permits for commercial uses. Consider issuing special use permits to wildlife tour companies. Do not allow weddings on the refuge. Restrict or eliminate competitive events. Phase out commercial horseback trail riding within 5 years. Control invasives for 5 years after use has been phased out or until they are eradicated.	Same as alternative B, plus: Limit the number of special use permits for wildlife-viewing tours to reduce traffic and other impacts on Elk Refuge Road.	Same as alternative C.

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<p>Allow commercial horseback trail rides along 1 mile segment of the Gros Ventre River as resources allow. Prohibit additional commercial horseback trail rides.</p> <p>Annually monitor commercial horseback riding trail and adjacent Gros Ventre River for invasive plant species. Treat new infestations before they expand and become a seed source that can be transported downstream on the refuge along the Gros Ventre River.</p>			
Special uses—environmental consequences			
<p>More activities that the refuge could not otherwise provide increase outreach about the refuge.</p> <p>Many commercial film companies would have access as staff time allowed.</p> <p>Research would collect and share information beneficial to the refuge.</p> <p>No weddings would happen at Miller House to comply with agency policy. Some public might be upset.</p> <p>There would be consistency in consideration of requesters of special use permits.</p> <p>Permit requirements would ensure uses have very little effect on other refuge resources and activities.</p> <p>Monitoring for and controlling new invasive plant infestations should prevent expansion on the refuge or Grand Teton National Park along Gros Ventre River.</p>	<p>Same as alternative A, plus:</p> <p>Fee collection would offset administrative costs of special use permits and be consistent with other land management agencies.</p> <p>Wildlife tour companies under permit to provide interpretation could increase public understanding of refuge purposes and management.</p> <p>No weddings would happen on the refuge to comply with agency policy. Some public might be upset.</p> <p>Eliminating commercial horseback riding will prevent one possible source of invasive plant introduction along the Gros Ventre River.</p>	<p>Same as alternative B, plus:</p> <p>Limiting commercial operators would help reduce traffic congestion and reduce wildlife disturbance on Elk Refuge Road.</p> <p>Fewer tours might not be able to meet public demand.</p> <p>Tour companies not selected for special use permits might have negative economic impacts.</p>	<p>Same as alternative C.</p>

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Soil erosion along commercial horseback riding trail would be minimal.			
General access and Elk Refuge Road—actions			
<p>From May 1 to November 30, keep open to the public Elk Refuge Road, Flat Creek Road, and the Curtis Canyon Road.</p> <p>From December 1 to April 30, keep open to the public the southern 3.5 miles of Elk Refuge Road.</p>	<p>Same as alternative A, plus:</p> <p>Consider more hunter access and designated parking lots for bison hunter access on the northern end of the refuge and archery hunter access on the western boundary of the refuge.</p>	Same as alternative B.	Same as alternative B.
General access and Elk Refuge Road—environmental consequences			
<p>Wildlife, especially elk and bison, would be protected from human disturbance during the critical winter season.</p> <p>Wildlife-viewing and photography opportunities would be available along the southern end of the refuge.</p>	<p>Bison harvest may increase if additional hunter access can be established on the northern end of the refuge.</p> <p>Elk harvest would likely increase because nonhunting sanctuaries on the western edge of the refuge would be eliminated.</p>	Same as alternative B.	Same as alternative B.
Access to the national forest—actions			
<p>Continue to allow overnight parking on Elk Refuge Road on April 30 for access to antler collection on the national forest.</p> <p>Limit access to the national forest to Crystal Butte, Dry Hollow, and Sheep Creek.</p> <p>Review access to the national forest from the “jump cliff” site and coordinate any actions with adjacent landowners.</p> <p>Allow winter users limited access on a trail to the national forest’s Goodwin Lake Ski Cabin. Issue special use permits for access to reach the trail and plow a parking area.</p>	<p>Same as alternative A, except:</p> <p>Prohibit overnight parking and camping associated with antler collection on the national forest:</p> <ul style="list-style-type: none"> ■ On May 1, consider opening the access gate later in the day than other national forest access gates. ■ Encourage the national forest to sign an egress route to prevent trespass in the Twin Creek subdivision for users of Goodwin Lake Ski Cabin on national forest land. 	Same as alternative B.	Same as alternative B.

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	<ul style="list-style-type: none"> ■ Ask the national forest to issue special use permits for parking on the refuge for users of the Goodwin Lake Ski Cabin on national forest land. 		
Access to the national forest—environmental consequences			
<p>Limited access would provide customer service while protecting resources, which demonstrates interagency cooperation.</p> <p>Minor wildlife disturbance, mainly of elk, would occur from people passing through the refuge to the national forest cabin.</p> <p>Staff would take time away from refuge duties to issue permits for an unrelated refuge activity. Staff duties and costs would increase in late April to manage the May 1 event.</p> <p>Closing “jump cliff” access to the national forest would decrease use in this area.</p>	<p>Same as alternative A, plus:</p> <p>There would be less trespass on private property by skiers using the egress route when leaving the national forest cabin.</p> <p>Permit administration would shift to the national forest, where the activity primarily occurs, and reduce the refuge staff workload.</p>	<p>Same as alternative B.</p>	<p>Same as alternative B.</p>
Public outreach—actions			
<p>Distribute news releases and articles about visitor opportunities, refuge management, and research.</p> <p>Maintain an email contact list of elected officials, partners, key community and business leaders, and agency contacts.</p> <p>Keep the refuge Web site current.</p> <p>Conduct media interviews.</p> <p>Use refuge leadership in an ambassadorial role in the community.</p>	<p>Same as alternative A, plus:</p> <p>Use more electronic media.</p> <p>Provide outreach on managing for migratory birds, wildlife disease, hunting, fishing, and changes that restrict or eliminate overnight parking, weddings, and competitive events.</p>	<p>Same as alternative B, plus:</p> <p>Provide outreach about the refuge’s role in the Greater Yellowstone Ecosystem.</p>	<p>Same as alternative B.</p>

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Provide outreach about refuge programs including management of elk and bison and refuge management practices.			
Public outreach—environmental consequences			
<p>A wide variety of internal and external audiences would be current on visitor opportunities and management activities.</p> <p>The public would understand elk and bison behavior, population fluctuations, and relationships to other species.</p> <p>Refuge users and critics would better understand use of the hunting program for management of wildlife populations and as a Refuge System priority use.</p> <p>Educating anglers to harvest nonnative trout would help agency efforts to improve the native trout fisheries.</p> <p>A leadership role in the community and with partners would require staff time.</p> <p>There would be limited outreach information because of insufficient staff and reliance on seasonal staff and volunteers.</p>	<p>Same as alternative A, plus:</p> <p>More people would be reached by using social media.</p> <p>People would learn about migratory birds and the importance of area closures during nesting.</p> <p>Antler collectors on the national forest would understand the change in refuge restrictions on overnight parking.</p> <p>People with authority to perform weddings would be aware that the refuge is not available.</p>	<p>Same as alternative B, plus:</p> <p>The public would better understand coordination between land managers in the Greater Yellowstone Ecosystem.</p>	<p>Same as alternative B.</p>
Visitor and Employee Safety and Resource Protection Goal—Provide for the safety, security, and protection of visitors, employees, natural and cultural resources, and facilities throughout the refuge.			
Visitor and employee safety—actions			
Emphasize employee and visitor safety.	<p>Same as alternative A, plus:</p> <p>Increase law enforcement during hunting season.</p> <p>Develop strategies with WGF D to increase hunter safety.</p>	Same as alternative B.	Same as alternative B.

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	<p>Revoke hunting permits when violations occur.</p> <p>Provide personal protective equipment and safety training for refuge staff.</p> <p>Consider designating off-road parking at the entrance with a relocated entrance kiosk.</p>		
Visitor and employee safety—environmental consequences			
<p>Safety programs would have positive effects on visitors and employees.</p>	<p>Same as alternative A, plus: More enforcement of regulations and coordination with WGF D during hunting season would keep a good safety record. More enforcement staff would increase costs.</p>	<p>Same as alternative B.</p>	<p>Same as alternative B.</p>
Resource protection—actions			
<p>Law enforcement staff protects natural and cultural resources, refuge facilities, visitors, and employees.</p> <p>With few law enforcement employees at the refuge, rely on the Teton County Sheriff’s Office, National Park Service, WGF D, and temporarily detailed law enforcement staff from within our agency.</p>	<p>Same as alternative A, plus: Increase law enforcement patrols in April.</p> <p>Develop methods to detect illegal taking of wildlife and wildlife parts.</p> <p>Increase staff and develop shift coverage for high visitor use seasons.</p> <p>Increase enforcement of regulations related to the Elk Refuge Road.</p>	<p>Same as alternative B, plus: Consider land exchanges with adjacent Federal agencies.</p>	<p>Same as alternative C.</p>
Resource protection—environmental consequences			
<p>Most major wildlife resource violations would be prevented.</p> <p>Backcountry violations would likely be missed and could result in loss of resources, because law enforcement staff would be insufficient to expand patrol operations into these areas.</p>	<p>More backcountry and boundary patrol efforts in April would deter refuge trespass and illegal removal of shed elk antlers and other wildlife parts.</p> <p>More staff might increase hunter and angler use data that could be used to guide future management.</p> <p>Increased staff, equipment, and patrol activity would have a higher cost.</p>	<p>Same as alternative B, plus: Land exchanges would simplify the refuge’s external boundaries. Hunters would be able to better understand their location and comply with refuge-specific regulations. Exchanges would be costly and time-consuming.</p>	<p>Same as alternative C.</p>

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	As visitor services expanded, the ability to protect the refuge resources would decline.		
Administration Goal —Provide facilities and effectively use and develop staff resources, funding, partnerships, and volunteer opportunities to maintain the long-term integrity of habitats and wildlife resources of the refuge.			
Funding and staff—actions			
<p>Keep current funding and staff of 10.5 FTE positions.</p> <p>Rely on nongovernmental partnership money to hire 12 seasonal employees as irrigators, feed operators, and naturalists.</p> <p>Rely on 20 volunteers for visitor services and 1 volunteer for biology fieldwork.</p> <p>Use two National Park Service employees for hunting law enforcement patrol.</p> <p>Use eight law enforcement staff members of our agency on detail to the refuge to manage the opening of antler collection on the national forest.</p> <p>Hire more staff if money is available.</p>	<p>Increase refuge base funding by \$200,000 to replace private contributions.</p> <p>Add 15 FTE positions:</p> <ul style="list-style-type: none"> ■ five permanent full-time employees (biological technician, rangeland specialist, environmental education specialist, law enforcement officer, and maintenance supervisor) ■ nineteen permanent seasonal employees (irrigators, feed operators, naturalists, and visitor center staff) <p>Continue to rely on volunteers to enhance work.</p>	<p>Same as alternative B, plus:</p> <p>Add 1.5 FTEs including:</p> <ul style="list-style-type: none"> ■ three permanent seasonal interpretive naturalists 	<p>Same as alternative C.</p>
Funding and staff—environmental consequences			
<p>Current funding and staff would be insufficient to conduct programs and achieve refuge goals.</p> <ul style="list-style-type: none"> ■ Refuge objectives could be achieved only through money from private organizations and the efforts of volunteers. Use of volunteers and seasonal employees would increase the supervisory workload for permanent staff. 	<p>Added staff would increase management capabilities:</p> <ul style="list-style-type: none"> ■ More field data and staff expertise would help manage elk and bison herds. ■ Native plant plots would provide a long-term seed source for management. 	<p>Same as alternative B, plus:</p> <p>More environmental education and interpretation would be presented on and off the refuge, year-round, with a focus on ecosystem functions.</p> <p>More people would understand refuge programs and learn about refuge wildlife in the ecosystem in addition to elk and bison.</p>	<p>Same as alternative C.</p>

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<ul style="list-style-type: none"> ■ Unpredictable funding could reduce the hiring of seasonal law enforcement officers, which could result in a scaled-back hunting program. This would reduce the harvest of elk and bison making it difficult to balance habitat and herd sizes. ■ The value of long-term monitoring efforts could be severely reduced if there were not enough staff or volunteers to continue data collection. This could negatively affect our ability to make management decisions based on sound science. <p>Working with partners providing private money would get citizens to support refuge management.</p>	<ul style="list-style-type: none"> ■ Efficient irrigation would increase forage production and reduce the need for supplemental feeding. ■ Public safety and wildlife protection would increase during hunting season. ■ Visitor services would have strong programs that provide education and benefits to the public year-round. <p>Private money would enhance refuge management.</p>		
Facilities—actions			
<p>Maintain key operational and visitor services infrastructure and other facilities as funding allows.</p> <p>Provide housing for staff and volunteers as available.</p>	<p>Same as alternative A, plus:</p> <p>Add up to five family houses and more seasonal housing.</p> <p>Develop bear regulations (food and trash handling) for resident employees and volunteers.</p> <p>Demolish and replace existing elk trap with a prefabricated elk trap that can be assembled anywhere.</p> <p>Relocate or demolish and replace in a new location the Calkins House when money is available.</p>	<p>Same as alternative B.</p>	<p>Same as alternative B.</p>

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Facilities—environmental consequences			
<p>The public would get information and services at functioning, maintained refuge buildings.</p> <p>Maintained and restored historical buildings would retain their value and potential as interpretive sites.</p> <p>Employees housed on the refuge would help us retain qualified staff, increase security, provide wildlife observations, and ensure access to equipment. These employees would shop in Jackson, adding to the town’s revenue.</p> <p>Bears might be attracted to refuge houses and become habituated. The bears could cause personal or property damage, which would require the removal or destruction of the bears.</p>	<p>Same as alternative A, plus:</p> <p>Highly qualified staff could be recruited because affordable housing would be available. Houses would reduce open space and might be perceived negatively by surrounding residents.</p> <p>Food handling regulations would prevent bears from becoming habituated to human food rewards.</p> <p>High-powered rifles would be used in the removed Calkins House area for elk and bison hunting; increased harvest could help meet herd size objectives. The incidental observation of wildlife and law enforcement violations by employees living in the house would be eliminated.</p>	<p>Same as alternative B.</p>	<p>Same as alternative B.</p>
Elk Refuge Road—actions			
<p>Provide access for staff, the public, and private landowners year-round.</p> <p>Provide seasonal access to the national forest.</p> <p>Enforce a no-stopping regulation to prevent road obstruction to other vehicular traffic.</p> <p>Teton County provides dust abatement during summer months.</p> <p>Plow snow out of turnouts to encourage vehicles to move off the road to view wildlife.</p>	<p>Same as alternative A, plus:</p> <p>Add new signing to prohibit stopping or parking on or along the road, and add interpretive signing.</p> <p>Develop a self-guided, interpretive tour route on Elk Refuge Road and Flat Creek Road.</p> <p>Maintain the road at a high standard in summer during heavy visitation. Enhance traffic signs and install speed limit signs north of the Curtis Canyon Road.</p> <p>Work with Teton County to modify dust abatement.</p>	<p>Same as alternative A, plus:</p> <p>Reduce the number of turnouts.</p> <p>Work with Teton County to stop dust abatement.</p>	<p>Same as alternative B.</p>

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	<p>Improve and increase the number of turnouts for winter use. Increase winter road maintenance.</p> <p>Work with Teton County on ways to create more room for all road users.</p> <p>Increase enforcement of current regulations.</p>		
Elk Refuge Road—environmental consequences			
<p>There could be more traffic incidents and spread of invasive plants from increased visitor and tour vehicles.</p> <p>Enforcing the no-stopping in the roadway regulation could relieve the traffic congestion.</p> <p>Turnouts would not have enough capacity to accommodate all visitors and might not be located in the best viewing locations.</p> <p>Trailhead parking would spill onto the road during hunting season, which could give the perception of favoritism to hunters and increase conflict between wildlife observers and hunters.</p> <p>Dust abatement treatments (salt-based) would attract bighorn sheep to the road:</p> <ul style="list-style-type: none"> ■ There would be better wildlife viewing. ■ People would more likely want to stop in the road. ■ There could be more conflicts between wildlife and people and vehicles. 	<p>Same as alternative A, plus:</p> <p>Enforcing no roadside parking would prevent creation of unwanted parking areas and associated disturbance to vegetation.</p> <p>Visitors would learn about refuge wildlife and management on the interpretive tour route.</p> <p>Road maintenance would improve human safety.</p> <p>More turnouts would provide safe areas for improved wildlife viewing. Turnouts and widening the road would disturb native plant communities and create habitat loss. There would be increased risk of invasive plant infestations from the soil disturbance and importation of fill material.</p> <p>Increased interpretation, road maintenance, and enforcement would cost more and require staff time.</p>	<p>Same as alternative A, plus:</p> <p>Reducing the number of turnouts would decrease soil disturbance, reduce the risk of spreading invasive plants, and reduce the cost and need for snowplowing.</p> <p>Visitors would not have a safe alternative for parking and wildlife viewing with fewer turnouts.</p> <p>Ending dust abatement would keep bighorn sheep dispersed away from the road:</p> <ul style="list-style-type: none"> ■ Human-wildlife conflicts would be reduced. ■ Visitors would have less opportunity for wildlife viewing overall, but viewing bighorn sheep would be in their natural dispersed population. ■ Fewer visitors might use the road, reducing congestion and the need for turnouts. ■ Less demand for tour companies might affect their revenue. 	<p>Same as alternative B.</p>

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<ul style="list-style-type: none"> ■ There would be more risk of disease transmission between bighorn sheep individuals and with livestock. <p>(Also refer to the earlier “Access to the National Forest” that addresses a specific use of Elk Refuge Road.)</p>			
Partnerships—actions			
<p>Work with State and county governments on project such as the nonmotorized North Highway 89 Pathway, Geographic Information System (GIS) mapping, and management of greater sage-grouse core areas.</p> <p>Participate in the Jackson Cooperative Elk Study Group, Greater Sage-Grouse Working Group, and Jackson Interagency Habitat Initiative.</p> <p>Collaborate with the Jackson Hole Weed Management Association.</p> <p>Work with organizations on projects such as the irrigation expansion project and voluntary use of lead-free ammunition.</p> <p>Collaborate with the Jackson District Boy Scouts for antler collection and sale.</p> <p>Develop partnerships to resolve elk and bison conflicts on private and public land with help from WGFD.</p> <p>Continue our partnership with the Grand Teton Association.</p>	<p>Same as alternative A, plus:</p> <p>Develop a Friends group. Emphasize private land projects through the Partners for Fish and Wildlife program.</p>	<p>Same as alternative B, plus:</p> <p>Emphasize partnerships that focus on special ecosystem values and landscape-scale projects.</p>	<p>Same as alternative B.</p>

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<i>Alternative A</i> (current management)— no action	<i>Alternative B</i> (enhance public use and intensive resource management)	<i>Alternative C</i> (emphasize intact ecosystems and promote natural processes)	<i>Alternative D</i> (promote natural habitats and balance public use)— proposed action
Partnerships—environmental consequences			
<p>Effective partnerships would provide resources to address issues:</p> <ul style="list-style-type: none"> ■ Ecosystem conservation could improve water quality on the refuge. ■ Coordination would benefit wildlife that cross boundaries. ■ Agencies and organizations would address specific issues like lead poisoning and needs such as invasive plant control. ■ The public would know about refuge topics and opportunities through the Greater Yellowstone Coordinating Committee, Teton County, and other organizations. ■ Jackson District Boy Scouts would help with antler pick up and manage an antler auction that would provide revenue for elk habitat projects. <p>Partnerships would support refuge funding for services:</p>	<p>Same as alternative A, plus:</p> <p>The public would become more aware of and be able to participate in wildlife conservation through the new Friends group, which would provide volunteers or money for biological and visitor services programs.</p> <p>Private landowner projects could benefit refuge habitat and wildlife populations.</p>	<p>Same as alternative B, plus:</p> <p>Ecosystem-wide research would help Jackson Hole land managers better understand and manage resources.</p> <p>Landscape-scale activities would divert staff efforts away from refuge issues and could reduce progress on resolving refuge-specific issues.</p>	<p>Same as alternative B.</p>

Table 4. Summary of the alternatives and their environmental consequences for the comprehensive conservation plan for the National Elk Refuge, Wyoming.

<i>Alternative A</i> (current management)— no action	<i>Alternative B</i> (enhance public use and intensive resource management)	<i>Alternative C</i> (emphasize intact ecosystems and promote natural processes)	<i>Alternative D</i> (promote natural habitats and balance public use)— proposed action
<ul style="list-style-type: none"> ■ Visitors would get information and services at the partnership-operated Jackson Hole and Greater Yellowstone Visitor Center. ■ Visitors could take part in refuge opportunities through the Grand Teton Association's sleigh ride program and operation of Miller House. 			
Socioeconomic impacts			
Management and visitation activities annually generate an estimated 31 jobs, \$1,356,100 in labor income, and \$2,032,500 in value added in the local economy.	Annually generate 4 additional jobs, \$207,200 more in labor income, and \$328,200 more in value added.	Annually generate 5 additional jobs, \$262,900 more in labor income, and \$413,800 more in value added.	Annually generate an additional 6 jobs, \$314,900 in labor income, and \$490,700 in value added.
Cumulative impacts			
<p>There would be no cumulative impacts, with the following precautions:</p> <ul style="list-style-type: none"> ■ Ban activities where federally listed species occur. ■ Regulate activities to lessen impacts to species. ■ Monitor goal achievement and unforeseen conditions and apply adaptive resource management. 	Same as alternative A.	Same as alternative A.	Same as alternative A.

