

# 5 Environmental Consequences

The environmental consequences discussed in this chapter are the potential effects on a resource as a result of carrying out the actions of an alternative. For a better understanding of why these effects may occur, refer to the descriptions of resource conditions and interactions in chapter 3 (affected environment).

This chapter includes the following sections:

- effects common to all alternatives
- description of consequences by alternative
- cumulative impacts
- summary of the effects

## EFFECTS COMMON TO ALL ALTERNATIVES

The U.S. Department of the Interior and its representatives are charged with managing archeological and historic sites found on federal land. Prior to all habitat and facility maintenance activities, appropriate efforts would be made to identify known and unknown cultural resources within the area of potential impact. Avoidance of cultural resources would be the preferred treatment. Mitigation of any impacts would be undertaken if impacts could not be avoided. The Service's regional cultural resources manager would be consulted during the planning phase of any proposed activity. The regional cultural resources manager would take the necessary steps to coordinate with the North Dakota State Historic Preservation Officer if needed.

## DESCRIPTION OF CONSEQUENCES BY ALTERNATIVE

This section describes the potential consequences of each alternative's actions on water resources, habitat and wildlife, and visitor services.

### **Alternative 1**—Current Management (*No Action*)

The anticipated effects of carrying out alternative 1 are described below.

#### ***Water Resources***

Water management would continue as outlined in the wetland management component of the step-



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*The blanketflower is a native prairie plant.*

down HMP to be developed. The focus would be to provide quality habitat for migrating and nesting waterfowl, migrating shorebirds, and nesting waterbirds. Migratory birds would benefit through water level controls that encourage (1) seed-producing vegetation during migration and (2) mud flats for invertebrates. In addition, moist soil management would provide nesting habitats for other wetland species.

#### ***Habitat and Wildlife***

Alternative 1 would maintain the current habitat management program at approximately the same intensity. Management practices would remain the same for uplands—management to encourage nesting by waterfowl and upland-nesting birds. Priority on waterfowl production would benefit waterfowl, but would not provide optimal habitat for migrating shorebirds and other grassland-nesting species. Grassland-dependent bird species would remain at current levels or decline since habitat blocks of contiguous grassland without trees would remain on the landscape.

Woodland-dependent species would remain at current levels because there would not be an expanded program to reduce trees and shrubs.

Through implementation of the IPM Plan (USFWS 2005), control of invasive plants would continue to reduce the acres affected and decrease the rate of expansion.

Native plant species would recover and habitat conditions for upland-nesting migratory birds would improve.

### *Visitor Services*

Public use would continue at the present level, with current management strategies. The refuge would provide quality, universally accessible, recreational opportunities for visitors of all ages and abilities. The draft compatibility determinations in appendixes K–R provide details about these public use programs.

#### *Hunting*

Hunting deer, upland game birds, fox, and cottontail would be permitted. Other species could not be hunted. The majority of current and potential hunters would find sufficient opportunities for quality hunts. Hunters seeking opportunities to hunt waterfowl would not be able to hunt on the refuge, but this hunting demand would be met on state and private lands in the area.

#### *Fishing*

The refuge fishery is temporary and sporadic in nature and there would be no expansion. Most anglers seeking fishing opportunities are aware of the cyclic nature of the refuge fishery. There are abundant fishing opportunities available on other federal, state, and private waters in the area to satisfy local demands.

#### *Wildlife Observation, Wildlife Photography, Interpretation, and Environmental Education*

Current on- and off-refuge opportunities for wildlife viewing, interpretation, and education would be retained. Most current and potential refuge visitors would find satisfactory opportunities for quality wildlife viewing and wildlife photography. Interpretative and environmental education facilities and programs would meet most visitors' expectations.

#### *Other Recreational Opportunities*

Refuge visitors would be allowed to collect berries, mushrooms, and asparagus for their own personal use. Recreational trapping would be allowed under special use permit, as would horseback riding.

## **Alternative 2—Enhanced Management**

The anticipated effects of carrying out alternative 2 are described below.

### *Water Resources*

Same as alternative 1.

### *Habitat and Wildlife*

Alternative 2 would be similar to the current habitat management program, but at an increased intensity. Management treatments would increase on upland nesting habitat and would benefit many more upland-nesting species including some of the

nationally declining, grassland-dependent species. Wetlands would be managed to encourage nesting by waterfowl and other wetland-nesting birds. Management of wetlands would focus on waterfowl production, migrating waterfowl, migrating shorebirds, and overwater-nesting species. Nonnative trees and select, planted tree rows (shelterbelts) would be removed, improving nesting success of grassland-nesting birds because of the increased contiguous habitat blocks, less fragmentation, and reduced predator perches.



USFWS

*Arrowwood Lake*

Woodland-dependent species would decrease because there would be an expanded program to reduce trees and shrubs.

Control of invasive plants would decrease the rate of expansion due to enhanced management on greater acreages and monitoring of management actions. Upland habitats would slowly recover to a more native plant species composition as invasive species were controlled. Habitat conditions would improve for many upland-nesting wildlife species, which would increase nesting success.

### *Visitor Services*

Alternative 2 calls for increased management strategies for public use. The refuge would provide quality, universally accessible, wildlife-dependent recreational opportunities for visitor of all ages and abilities. The draft compatibility determinations in appendixes K–R provide details about these public use programs.

#### *Hunting*

Hunting deer, upland game birds, fox, and cottontail would continue to be allowed. Other species could not be hunted. Most current and potential hunters would find sufficient opportunities for quality hunts. Clarified regulations, along with limiting other recreational uses during the deer season, would improve the hunting experience for most refuge hunters. Hunters seeking opportunities to hunt waterfowl would not be able to hunt on the refuge,

but this hunting demand would continue to be met on state and private lands in the area.

The quality of the hunting experience would be enhanced through clarified and modified refuge-specific regulations. The risk of injury would be reduced and conflicts between user groups minimized by restricting other refuge uses during the archery, deer gun, and muzzleloader seasons.

#### *Fishing*

The refuge fishery is temporary and sporadic in nature; however, opportunities to expand the program would be reviewed. The visitor experience for fishing would be benefited if funding became available for facilities to accommodate users at different locations.

Angling experiences would be enhanced through clarified information about fishing access, as provided in revised “tear sheets” and brochures.

Hunted species would have a safe haven for resting when boating or canoeing ceases prior to the September waterfowl seasons, per revised refuge-specific regulations. Anglers would have a shorter season (than currently) for using boats.

#### *Wildlife Observation, Wildlife Photography, Interpretation, and Environmental Education*

Potential conflicts between refuge user groups would be minimized or eliminated based on increased user understanding of access for wildlife observation, wildlife photography, and other wildlife-dependent recreational activities, due to clarified refuge-specific regulations.

Environmental education programs would be developed for presentation on and off refuge. Additional workshops, presentations, and classroom opportunities would be available due to construction of suitable facilities. Wildlife-viewing opportunities would be increased with the development of additional trails and overlooks, and improved signs. The aesthetic beauty of the refuge’s natural areas would be enhanced through removal of unnecessary signs.



*Carrington third graders participate in the dedication of the Mud Lake observation deck.*

#### *Other Recreational Opportunities*

Same as alternative 1.

### **Alternative 3—Enhanced Refuge and Watershed Management (*Proposed Action*)**

The anticipated effects of carrying out alternative 3 are described below.

#### *Water Resources*

Same as alternative 1 with the addition of improving the upper James River watershed. Improving the health of the upper James River watershed would improve water quality and reduce peak flows during high-water events. This would improve wetland habitat on the refuge and benefit Jamestown Reservoir and all downstream users.

#### *Habitat and Wildlife*

In addition to the benefits described for alternative 2, there would be an increase in wildlife habitat and habitat values due to the watershed management component of alternative 3. Working with private landowners the Service would strive to protect and restore wetlands and grasslands in the watershed. In addition, improved water quality and reduced flood flows would improve habitat for aquatic species and waterbirds throughout the James River watershed.

#### *Visitor Services*

Same as alternative 2. The draft compatibility determinations in appendixes K–R provide details about the public use programs.

## **CUMULATIVE IMPACTS**

Cumulative impacts include the incremental effects of the actions for an alternative, when these are added to foreseeable actions of the past, present, and future. These cumulative impacts can be the result of individually minor impacts, which can become significant when added over time.

The NEPA requires mitigation measures when the environmental analysis process detects possible significant impacts to habitat, wildlife, or the human environment.

None of the activities proposed are expected nor intended to produce significant levels of environmental impacts that would require mitigation measures. Nevertheless, the final CCP would contain the following measures to preclude significant environmental impacts from occurring:

- Federally listed species would be protected from intentional or unintended impacts by having activities banned where these species occur.

- Hunting safety regulations would be closely coordinated with and enforced by personnel from the refuge and the NDGF.
- All proposed activities would be regulated to lessen potential impacts to wildlife and plant species, especially during the sensitive reproductive cycles.
- Monitoring protocols would be established to determine goal achievement levels and possible unforeseen impacts to resources, for application of adaptive resource management to ensure wildlife and habitat resources, as well as the human environment, are preserved.

- The CCP could be revised and amended after 5 years of implementation, for application of adaptive resource management to correct unforeseen impacts that occur during the first years of the plan.

## SUMMARY OF THE EFFECTS

Table 5 summarizes the estimated effects—impacts and benefits—associated with carrying out each alternative.

**Table 5. Comparison of impacts and benefits of management alternatives for Arrowwood NWR, North Dakota.**

<b>ALTERNATIVE 1</b> Current Management ( <i>No Action</i> )	<b>ALTERNATIVE 2</b> Enhanced Management	<b>ALTERNATIVE 3</b> Enhanced Refuge and Watershed Management ( <i>Proposed Action</i> )
<b>Water Resources</b>		
<p>Water quality and quantity entering the refuge would remain at current levels.</p> <p>Target elevations would be achieved 70% of the time.</p>	<p><i>Same as alternative 1.</i></p>	<p>Water quality would be improved and peak flows during high-water events would be reduced.</p> <p>Wetland habitats would be improved and target elevations should be met more often.</p> <p>Water quality leaving the refuge should be improved and benefit Jamestown Reservoir and all downstream users.</p>
<b>Habitat and Wildlife—Upland</b>		
<p>There would be nesting habitat for waterfowl, but there would not be optimal habitat for migrating shorebirds and other grassland-nesting species.</p>	<p>Waterfowl nesting habitat would improve as habitat conditions improve.</p> <p>Nesting success for grassland-nesting birds would improve because of the increased quality habitat and less fragmentation.</p>	<p><i>Same as alternative 2, plus:</i></p> <p>Grassland-dependent species would benefit from increased protection and restoration of off-refuge habitat.</p>
<b>Habitat and Wildlife—Woodland and Shelterbelts</b>		
<p>The gradual decrease in shelterbelts and other planted trees would slowly increase the block size of grassland habitats for grassland-nesting birds, reduce predators, and decrease the woodland species diversity in selected units.</p>	<p>Removal of nonnative trees and shelterbelts would immediately increase the block size of grassland habitats for grassland-nesting birds and reduce predators.</p> <p>Abundance of woodland species would decrease in selected units as the trees were removed.</p>	<p><i>Same as alternative 2.</i></p>

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<b><i>Habitat and Wildlife—Wetland</i></b>		
<p>There would be nesting habitat for waterfowl.</p> <p>There would be limited habitat for migrating shorebirds and limited nesting habitat for other waterbirds.</p>	<p>There would be nesting and migration habitat for waterfowl, shorebirds, and other waterbirds.</p>	<p><i>Same as alternative 2, plus:</i></p> <p>Water quality would be improved. Peak flows entering the refuge would be reduced.</p> <p>The wetlands and riparian habitat in the watershed would be restored and protected.</p>
<b><i>Habitat and Wildlife—Invasive Plants</i></b>		
<p>Invasive species should decrease. New infestations would be contained.</p> <p>Upland habitat conditions would slowly improve, which should result in increased nesting of grassland-dependent species.</p>	<p>Invasive species would be significantly reduced. Upland habitats would improve to a more native plant species composition as invasive species were controlled.</p> <p>Habitat conditions would improve for many upland-nesting wildlife species, which would increase the nesting success.</p>	<p><i>Same as alternative 2.</i></p>
<b><i>Habitat and Wildlife—Waterfowl</i></b>		
<p>Waterfowl breeding and migration numbers would remain constant.</p>	<p>Waterfowl breeding numbers would increase. Waterfowl migration numbers would increase in the fall due to additional undisturbed and “safe haven” habitat in September due to restricted boating.</p>	<p><i>Same as alternative 2.</i></p>
<b><i>Habitat and Wildlife—Predator Management</i></b>		
<p>Predator populations would fluctuate.</p>	<p>Predator populations would remain at acceptable levels.</p>	<p><i>Same as alternative 2.</i></p>
<b><i>Habitat and Wildlife—Threatened and Endangered Wildlife</i></b>		
<p>Management of Jim Lake for piping plovers during drought years would maintain or increase the piping plover numbers.</p>	<p><i>Same as alternative 1.</i></p>	<p><i>Same as alternative 1.</i></p>
<b><i>Visitor Services—Hunting</i></b>		
<p>Hunter numbers and satisfaction would remain relatively unchanged.</p>	<p>The quality of the hunting experience would be enhanced through clarification and revision of regulations. Hunters would find it easier to understand the regulations, and potential conflicts with other users would be reduced.</p>	<p><i>Same as alternative 2.</i></p>

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<b>Visitor Services—Fishing</b>		
Fishing opportunities would continue to be sporadic and anglers would find it difficult to understand the fishing regulations.	Fishing opportunities would be reduced in most years due to the electric fish barrier and lower target water elevations. In high-water years, the quality of the fishing experience would be enhanced through clarification or revision of the fishing access information.	<i>Same as alternative 2.</i>
<b>Visitor Services—Wildlife Observation and Wildlife Photography</b>		
Wildlife observation and wildlife photography opportunities would minimally meet the needs of the public.	Enhanced and expanded wildlife-viewing opportunities may cause additional disturbance to wildlife, especially waterfowl and shorebirds. Uses would be monitored and evaluated to minimize and mitigate any adverse effects.  Conflicts with other refuge users would be minimized, as well as safety increased, due to the revised access regulations.	<i>Same as alternative 2.</i>
<b>Visitor Services—Interpretation, Outreach, and Environmental Education</b>		
Interpretation, outreach, and environmental education would minimally meet the public demand.	There would be greater public understanding and appreciation of the refuge resources and issues due to expanded interpretive, outreach, and educational programs.	<i>Same as alternative 2.</i>
<b>Staffing</b>		
With stable staffing levels, the habitat quality and wildlife response would remain constant.  Habitat and wildlife populations would be minimally monitored to determine if the goals and objectives were being met.  Public use would be provided through adequately staffed programs.  Maintenance of facilities would remain constant, with improvements as funding allowed.	Maximum benefits to wildlife would be achieved through full staffing to carry out all management strategies.  Habitat and wildlife populations would be effectively monitored to determine if the goals and objectives were being met.  Increased public use and visitor satisfaction would be provided through adequately staffed programs.  Maintenance of facilities would be enhanced, with improvements as funding allowed.	<i>Same as alternative 2.</i>

