

# *Management Direction*

## **Refuge Management Direction:**

### **Goals, Objectives and Strategies/Projects**

Development of Refuge goals and objectives involved the melding of multiple sources of information including the review and interpretation of national plans, review and interpretation of existing scientific literature, an evaluation of existing habitat conditions on the Refuge, and the personal knowledge of planning team participants. Refuge objectives were derived using species-habitat requirements (See Appendix H). However, many of these species deemed important in national plans were used as “indicators” to prepare objectives that satisfy the needs of multiple species. Other consulted sources of information included Partners in Flight lists, Audubon Watch lists, Bird Conservation Region lists, and the Refuge wildlife observation log books. Constraints considered during plan formulation include number of employees, financial resources, equipment availability, harsh winter conditions, arid climate, lessons learned from previous management efforts, and the likelihood of success.

## **Riparian Habitats**

**Riparian Habitat Goal:** *Provide a riparian community representative of historic flora and fauna in a high valley of the southern Rocky Mountains to provide habitat for migratory birds, mammals, and river-dependent species.*

## **Riparian Habitats**

(Detailed biological justification is discussed in Appendix H.)

- 1. Objective:** Restore 50 to 100 acres of dense (40 to 100 percent) willow in patches >.2 ha and 20 m wide in the central third of the Illinois River (from the north end of the island to the confluence with Spring Creek) to connect existing willow patches and maintain 535 acres of dense willow in patches in the lower third of the Illinois River to benefit nesting neotropical migrant songbirds (yellow warbler, willow flycatcher) and resident moose, river otter, and beaver.

### **Strategies:**

- Willow plantings along the stream corridor combined with 8 foot fences to exclude large herbivores.
- Water manipulation Refuge-wide that may involve decreased diversions to maintain in-stream flows for willow establishment.
- Construction of small artificial dams in the river to raise water tables locally to aid in willow establishment.
- Establish a vegetation monitoring plan to assess health of established willow stands, and measure and document success or changes needed in reestablishment efforts. Plan should include herbivory and hydrology factors.
- Wildlife monitoring will occur to document changes in wildlife use and possible correlations to changes in habitat.
- Experiment with alternative willow restoration strategies.
- Consider hunting as a management tool.

**Rationale:** Sections of the Illinois River on the Refuge had willows removed prior to acquisition by the FWS, probably in an effort to increase hay yields. These open stretches of river have: less bank stability, resulting in potential for increased sedimentation; decreased shade over the stream, resulting in increased water temperatures for trout; and sparse woody vegetation for use by songbirds or other wildlife. A section of river further downstream from the proposed reestablishment site has had livestock grazing removed for 8 years, but has shown little willow regeneration. Given the growth characteristics of willows, these results lead to the conclusions that there is either significant herbivory other than livestock restraining willow expansion, and/or hydrology has been altered enough with upstream diversions and recent drought conditions that lack of groundwater is keeping willow establishment from occurring. With this in mind, willow plantings will only be done in association with fencing, and consideration of hydrological needs will be used as well. Possible methods of increasing groundwater needs will be: to divert less water upstream for other Refuge purposes; locate willow plantings adjacent to existing beaver dams to take advantage of higher water tables near these ponds; and place logs and other natural materials in the stream to create simulated beaver dams and raise water tables adjacent to areas to be planted. Monitoring will be essential to document reestablishment efforts, and to note any significant changes to existing willow communities.

2. **Objective:** Provide 3,630 to 3,845 acres, over a 5-year average, of a grass:forb (75:25) plant community composed primarily of native plants (rushes, sedges, grasses, forbs) characterized by 10 to 30 cm visual obstruction reading, 0 to 10 cm duff layer and minimal (<5 percent) bare ground and less than 40 percent (canopy closure) willow to benefit nesting waterfowl (pintail, shoveler, gadwall, green-winged teal) and sage grouse broods.

**Strategies:**

- Utilize grazing, resting, and burning practices to stimulate or maintain meadow conditions.
- Irrigate areas as water is available to help stimulate vegetative growth.
- Develop a vegetation monitoring protocol.
- Develop a wildlife monitoring plan that correlates wildlife use and habitat condition.
- Consider hunting as a management tool.

**Rationale:** The grass:forb mix identified in the objective requires periodic manipulation of some sort to achieve the stated ranges of the objective. The combination of resting, grazing, and burning, combined with irrigation, where available and practical, are the best tools to accomplish this. It is anticipated that on average, 1/3 to 2/3 of this area will require grazing at an average rate of 0.4 to 1.0 AUMs per acre resulting in the removal of approximately 1,950 to 4,200 AUMs of forage. Vegetative monitoring combined with wildlife use data will be needed to document that objective levels are correct.

3. **Objective:** Provide 210 to 425 acres, over a 5-year average, of a grass:forb (75:25) plant community composed primarily of native species (grasses, sedges, forbs, and rushes) characterized by >30 cm visual obstruction reading, 10 to 20 cm duff layer and minimal (<5 percent) bare ground, and less than 40 percent (canopy closure) willow from mid-April through August to benefit nesting waterfowl (mallard, gadwall, pintail, scaup), songbirds (savannah sparrow, meadowlark), and foraging shorebirds if flooded (snipe, phalarope, white-faced ibis, sora, curlew, willet).

**Strategies:**

- Utilize grazing, resting, and burning practices to stimulate or maintain meadow conditions.
- Irrigate areas as water is available to help stimulate vegetative growth.
- Develop a vegetation monitoring protocol.
- Develop a wildlife monitoring plan that correlates wildlife use and habitat condition.
- Consider hunting as a management tool.

**Rationale:** The grass:forb mix identified in the objective requires periodic manipulation of some sort to achieve the stated ranges of the objective. The combination of resting, grazing, and burning, combined with irrigation, where available and practical, are the best tools to accomplish this. To meet and maintain the taller vegetation and duff layers identified, it is anticipated that rest will be utilized more for this objective. It is anticipated that on average, 1/3 to 1/2 of this area will require grazing at an average rate of 0.4 to 1.0 AUMs per acre resulting in the removal of approximately 100 to 350 AUMs of forage. Vegetative monitoring combined with wildlife use data will be needed to document that objective levels are correct.

4. **Objective:** Given the altered river flow regime, provide a properly functioning river channel characterized by a well defined thalweg (deepest point in the river channel), outside river edges that are deeper than inside edges, a river sinuosity of 2.0 to 2.5, pool spacing every 7 to 9 channel widths, active point bar formation, and gradients in riffles that are higher than in pools to benefit willow establishment for neotropical migrants, and indirectly provide suitable habitat for native and nonnative fishes.

**Strategies:**

- Map river channel and identify problem areas. Prioritize stretches for rehabilitation.
- Alter irrigation diversions as needed to assist in-stream restoration.
- Install in-stream structures as necessary to adjust thalweg, create point bars, adjust depth ratios, increase sinuosity, and/or adjust pool spacing.
- Monitor wildlife and vegetative response to these strategies.

**Rationale:** Mapping the river to identify current characteristics is needed in order to define where restoration is needed. Increasing flows in the river by diverting less water on upstream Refuge water rights may assist in maintaining higher water tables, especially when used in conjunction with in-stream restoration projects. Documenting vegetative, fishery, and wildlife response is necessary to ensure that the projects are working.

5. **Objective:** Establish a private lands program to encourage restoration of degraded riparian zones through funding and technical assistance to accomplish similar objectives as those defined for the Refuge. High priority areas are those that have immediate influence on the Refuge because of drainage or proximity.

**Strategies:**

- Add a full-time private lands position to the staff.
- Work with local partners and willing landowners to identify, prioritize, and restore degraded areas in North Park.

6. **Objective:** Work with partners to address land health issues throughout Jackson County.

**Strategy:**

- Continue active Refuge participation in Sage Grouse Working Group, North Park Wetlands Focus Group, Owl Mountain Partnership, North Park Habitat Partnership Program, and any other group formed with the goals of improving land health and/or stewardship in Jackson County.
- Partner with Jackson County weed coordinator to manage and minimize noxious weeds on the Refuge.
- Variations in water diversions and/or grazing regimes.
- Use adaptive management techniques to implement new management ideas.

**Rationale:** The Refuge has the ability and resources available to restore and maintain a productive riparian area for the benefit of wildlife, fisheries, water quality, and a healthy landscape, while also utilizing local agriculture. The streams within the Refuge boundaries are a small fragment of those located within Jackson County, Colorado. By working with interested landowners and partners, the possibility exists of expanding the benefits of a healthy riparian zone throughout North Park.

From time-to-time, projects may be proposed within the county by other agencies, non-government organizations, or private landowners, that have a benefit to ecosystem health and wildlife outside of the Refuge boundary. There may be an occasion that in order to make an off-Refuge project succeed, resources normally reserved for Refuge purposes, such as water or vegetative cover, could be used to help make the off-Refuge project successful. These would not be long-term commitments of Refuge resources, but rather a management decision that a short-term diversion of these resources would better be served to benefit the ecosystem as a whole.

## **Wetland Habitats**

**Wetland Goal:** *Provide and manage natural and man-made permanent and semipermanent wetlands (in three wetland complexes) to provide habitat for migratory waterfowl, shorebirds, wading birds, and associated wetland-dependent wildlife.*

## **Wetland Habitats**

- Objective:** Maintain 10 acres of, and attempt to establish in one other wetland basin, tall ( $\geq 60$  cm visual obstruction reading) emergent vegetation in water depths  $>4$  cm over a 5-year period to provide nesting habitat for over-water nesting birds (black-crowned night-heron, white-faced ibis, waterfowl, marsh wrens, coots, rails, and blackbirds).

### **Strategies:**

- Water level manipulation, including drawdowns, and maintaining water levels in specific wetlands from spring to fall when possible.
- Develop and apply a plan for transplanting of cattail and hardstem bulrush into specific wetlands.
- Develop and use an over-water nesting bird monitoring plan.
- Develop and implement an annual water management plan as a component of an overall habitat management plan.

**Rationale:** Wetlands with tall dense vegetation provide a litter layer for use by nesting water birds as well as a flooded emergent litter for macroinvertebrate production. Manipulation of water levels will contribute to maintaining the existing wetlands with tall emergent vegetation. Transplanting cattail and hardstem bulrush in wetlands with the highest potential for success will help increase the availability of this type of habitat. The criteria for such wetlands would be based on such things as water control abilities, evaporation rates, and distribution. Timing of needed drawdowns for expansion of the tall dense vegetation will be planned in such a way as to get maximum benefit for all Refuge wetland objectives such as during shorebird migration or to stimulate submergent aquatic vegetation beds. Monitoring water bird species will help assess how successful habitat management is.

- Objective:** Provide 10 percent of the wetland acres, over a 5-year average, in short ( $<10$  cm), sparse ( $<10$  cm visual obstruction reading) emergent vegetation in water depths  $<4$  cm from April to August to provide foraging habitat for shorebirds and waterfowl, as well as nesting and brood-rearing habitat for shorebirds.

### **Strategies:**

- Water level manipulation, including full and partial drawdowns, and maintaining water levels in specific wetlands from spring to fall when possible.
- Tillage of dry wetlands as a management tool.
- Rehabilitation and maintenance of existing dikes and infrastructures.
- Conduct shorebird surveys on the Refuge.
- Monitor monthly wetland bird use.
- Develop and apply a wetland emergent/submergent vegetation monitoring plan.
- Develop and implement an annual water management plan as a component of an overall habitat management plan.

3. **Objective:** Provide 20 percent of the wetland acres, over a 5-year average, of emergent vegetation >25 cm tall with visual obstruction reading >80 percent of vegetation height in water depths 4 to 18 cm to provide escape cover and foraging habitat for dabbling duck broods and molting ducks and foraging habitat for water birds.

**Strategies:**

- Water level manipulation, including full and partial drawdowns, and maintaining water levels in wetlands from spring to fall when water is available and conditions are appropriate.
- Tillage of dry wetlands as a management tool.
- Rehabilitation and maintenance of existing dikes and infrastructures.
- Conduct waterfowl surveys on the Refuge.
- Monitor monthly wetland bird use.
- Develop and apply a wetland emergent/submergent vegetation monitoring plan.
- Develop and implement an annual water management plan as a component of an overall habitat management plan.

**Rationale:** The availability of a variety of wetland habitat conditions may benefit a greater diversity of wildlife species and/or support species for longer periods in their annual life cycle. The above two objectives contribute to habitats varying from shallowly flooded, short, sparse emergents to both shallow water and moderately dense cover. Water manipulation techniques including drawdowns and back flooding can be used to create these conditions. Using monitoring to evaluate the response of the flora and fauna will indicate success of management techniques. Short-term variations of habitat objectives may be considered, on a case-by-case basis, by Refuge management to promote other important ecosystem projects within North Park.

4. **Objective:** Provide 10 to 20 percent of the wetland acres within each wetland complex, over a 5-year average, with a 70 percent coverage of submergent aquatic vegetation species (*Potamogeton*, *Ruppia*) in wetlands of >18 cm water depth to provide invertebrates and seed sources for foraging water birds, especially waterfowl broods, and escape cover for diving ducks.

**Strategies:**

- Water level manipulation, including full and partial drawdowns, and maintaining water levels in wetlands from spring to fall when water is available and conditions are appropriate.
- Tillage of dry wetlands as a management tool.
- Rehabilitate and maintain existing dikes and infrastructures.
- Conduct waterfowl surveys and brood counts on the Refuge.
- Monitor monthly wetland bird use.
- Develop and apply a wetland submergent vegetation monitoring plan.
- Develop and implement an annual water management plan as a component of an overall habitat management plan.

**Rationale:** Submergent vegetation provides a complex structure for macroinvertebrate production and a seed source for foraging water birds. *Potamogeton* and *Ruppia* both produce a food resource (plant foods and invertebrates) for waterfowl and broods. These submergents are used by other wetland birds for nesting, foraging, and escape habitat. A variety of drawdown schedules and tillage are used to enhance the growth of these plants. Monitoring the responses of plant and wildlife will gauge the level of success in providing this habitat.

5. **Objective:** Enhance the existing private lands program to encourage creation and restoration of wetlands in North Park and surrounding areas through funding and technical assistance to accomplish the same objectives as on the Refuge.

**Strategies:**

- Obtain funding and full-time equivalency for a Partners for Fish and Wildlife position.
- Work with willing stakeholders to create and restore wetlands in North Park.
- Develop a plan to identify wetland habitats throughout North Park.
- Consider wetland development opportunities as they become available.
- Continue participation in the North Park Wetland Focus Group.
- Establish a monitoring plan for created habitats to ensure benefits are realized.

**Rationale:** Since the Refuge is only part of the total North Park landscape efforts, to look beyond the boundaries are important in an ecosystem approach. Many wetland potentials exist in North Park, and working to restore or create these wetlands will benefit not only wildlife but society as well. To achieve the most positive results, priority projects will be close to existing wetland complexes or reasonably well functioning segment of rivers or near the larger reservoirs. Wetland management would mimic above Refuge objectives when possible. Work would be completed with the help of others to identify wetland habitats throughout North Park, partnering with willing stakeholders to restore, protect, and improve wetland habitats for wildlife use. Set up demonstration areas practicing sound wetland habitat management, and improve water levels in wetlands from spring to fall when possible.

## **Meadow Habitats**

**Meadow Habitat Goal:** *Provide and manage irrigated, grassland dominated meadows historically developed for hay production, to support sage grouse broods, waterfowl nesting, and meadow-dependent migratory birds.*

## **Meadow Habitats**

Detailed biological justification is discussed in Appendix H.

1. **Objective:** Provide 20 to 50 acres, over a 5-year average, of a grass:forb (75:25) plant community composed primarily of native plants (rushes, sedges, grasses, forbs) characterized by <20 cm height, <10 cm visual obstruction reading, with dry to moist soils (no standing water), adjacent to (within 50 m) or intermingled with sagebrush (10 to 25 percent sage canopy cover), from early-June to late-July, to benefit sage grouse and snipe broods.

### **Strategies:**

- Utilize grazing, resting, and burning practices to stimulate or maintain meadow conditions.
- Irrigate areas as water is available to help stimulate vegetative growth.
- Working with partners, develop a vegetation monitoring protocol.
- Working with partners, develop a wildlife monitoring plan that correlates wildlife use and habitat condition.
- Consider hunting as a management tool.

2. **Objective:** Provide 1,650 to 1,850 acres, over a 5-year average, of a grass:forb (75:25) plant community composed primarily of native species (grasses, sedges, forbs, rushes) characterized by 10 to 30 cm visual obstruction reading, 0 to 10 cm duff layer and minimal (<5 percent) bare ground from mid-April to the end of July to benefit nesting waterfowl (gadwall, shoveler, pintail, green-winged teal) and sage grouse broods.

### **Strategies:**

- Utilize grazing, resting, and burning practices to stimulate or maintain meadow conditions.
- Irrigate areas as water is available to help stimulate vegetative growth.
- Working with partners, develop a vegetation monitoring protocol.
- Working with partners, develop a wildlife monitoring plan that correlates wildlife use and habitat condition.
- Consider hunting as a management tool.

**Rationale:** The grass:forb mix identified in the objective requires periodic manipulation of some sort to achieve the stated ranges of the objective. The combination of resting, grazing, and burning, combined with irrigation, where available and practical, are the best tools to accomplish this. It is anticipated that on average, 1/3 to 2/3 of this area will require grazing at an average rate of 0.4 to 1.0 AUMs per acre resulting in the removal of approximately 950 to 2,100 AUMs of forage. Vegetative monitoring combined with wildlife use data will be needed to document that objective levels are achieved, and whether or not objectives are correct.

3. **Objective:** Provide 630 to 790 acres, over a 5-year average, of a grass:forb (75:25) plant community composed primarily of native plants (grasses, sedges, forbs, rushes) characterized by >30 cm visual obstruction reading, 10 to 20 cm duff layer and minimal (<5 percent) bare ground to benefit nesting waterfowl (mallard, gadwall, pintail, scaup), songbirds (savannah sparrow, meadowlark), and foraging shorebirds if flooded (snipe, phalarope, white-faced ibis, curlew, willet, sora).

**Strategies:**

- Utilize grazing, resting, and burning practices to stimulate or maintain meadow conditions.
- Irrigate areas, as water is available, to help stimulate vegetative growth.
- Working with partners, develop a vegetation monitoring protocol.
- Working with partners, develop a wildlife monitoring plan that correlates wildlife use and habitat condition.
- Consider hunting as a management tool.

**Rationale:** The grass:forb mix identified in the objective requires periodic manipulation of some sort to achieve the stated ranges of the objective. The combination of resting, grazing, and burning, combined with irrigation, where available and practical, are the best tools to accomplish this. To meet and maintain the taller vegetation and duff layers specified, it is anticipated that rest will be utilized more for this objective. It is anticipated that on average, 1/3 to 1/2 of this area will require grazing at an average rate of 0.4 to 1.0 AUMs per acre resulting in the removal of approximately 350 to 700 AUMs of forage. Vegetative monitoring combined with wildlife use data will be needed to document that objective levels are achieved, and whether results support species requirements.

4. **Objective:** Short-term variations of habitat objectives may be considered, on a case-by-case basis, by Refuge management for important ecosystem projects within North Park.

**Strategies:**

- Work with partners to identify potential projects in the county.
- Implement variations in water diversion, grazing regimes or other Refuge management strategies as deemed appropriate.

**Rationale:** From time-to-time, projects may be proposed within the county by other agencies, non-government organizations, or private landowners, that have a benefit to ecosystem health and wildlife outside of the Refuge boundary. In order to make an off-Refuge project succeed, resources normally reserved for Refuge purposes, such as water or vegetative cover, could be used occasionally to help make a project successful. These would not be long-term commitments of resources, but rather a cooperative management decision that a short-term diversion of these resources would better be served to benefit the ecosystem as a whole.

5. **Objective:** Establish a private lands program to provide funding and technical assistance to encourage wildlife-compatible land management practices in meadow habitats to accomplish objectives similar to those of the Refuge.

**Strategies:**

- Add a full-time private lands position to the staff.
- Work with local partners and willing landowners to identify, prioritize, and restore degraded areas and create new wildlife habitat in North Park.

6. **Objective:** Work with partners to address land health issues throughout the county.

**Strategy:**

- Continue active Refuge participation in Sage Grouse Working Group, North Park Wetlands Focus Group, Owl Mountain Partnership, North Park Habitat Partnership Program, and any other group formed with the goals of improving land health and/or stewardship in Jackson County.
- Partner with Jackson County weed coordinator to manage and minimize noxious weeds on the Refuge.

**Rationale:** The Refuge has the ability and resources available to maintain productive meadows for the benefit of wildlife, water quality and a healthy landscape, while also utilizing local agriculture. The meadows within the Refuge boundary were used to produce hay prior to Refuge establishment, and proposed management practices vary little from thousands of similar acres throughout the county that are still in hay production. By working with interested landowners and partners, the possibility exists of expanding the wildlife benefits of Refuge meadows and/or maintaining the benefits that are occurring on these off-Refuge sites.

## **Upland Habitats**

**Upland Habitats Goal:** *Provide a sagebrush/grassland upland community representative of the historic flora and fauna in a high valley of the southern Rocky Mountains to provide habitat for sage grouse, large mammals, and other shrub associated species.*

## **Upland Habitats**

Detailed biological justification is discussed in Appendix H.

- 1. Objective:** Provide 2,000 acres, over a 5-year average, of uplands composed of shrubs (>70 percent sage) >25 cm height and 20 to 30 percent canopy cover, >20 percent grass cover, and >10 percent forbs (native species preferred) to benefit sage grouse, vesper sparrow, brewers sparrow, elk, and pronghorn antelope.

### **Strategies:**

- Complete a sagebrush/grassland upland habitat inventory of the Refuge by 2008.
- Use cattle grazing at varying stock rates, seasons, and intensities as a management tool for uplands.
- Use 'rest' (free from biological, mechanical, or chemical manipulation) of varying lengths of time as a management tool for uplands.
- Develop and implement an integrated pest management plan.
- Use a variety of mechanical treatments of the habitat as a management tool for uplands.
- Develop and implement a vegetation monitoring plan.
- Develop and implement a wildlife monitoring program.

2. **Objective:** Provide 2,000 acres, over a 5-year average, of uplands composed of shrubs (>70 percent sage) >40 cm height and >30 percent canopy cover, <20 percent grass cover, and >5 percent forbs (native species preferred) to benefit brewer's sparrow, sage thrasher, and pronghorn antelope.

**Strategies:**

- Complete a sagebrush/grassland upland habitat inventory of the Refuge by 2008.
- Use cattle grazing at varying stock rates, seasons, and intensities as a management tool for uplands.
- Use 'rest' of varying lengths of time as a management tool for uplands.
- Develop and implement an integrated pest management plan.
- Use a variety of mechanical treatments of the habitat as a management tool for uplands.
- Develop and implement a vegetation monitoring plan.
- Develop and implement a wildlife monitoring program.

**Rationale:** The Refuge has five primary range sites that support sagebrush/grassland uplands. The 2,000 acres of each of the above objectives are scattered within several of these range types and intermingled with meadow areas. A completed inventory of the uplands will assist in specifically defining these areas. Sagebrush/grassland uplands in a mosaic of patchy sagebrush with openings of grasses and forbs across the landscape reflect the needs of most wildlife species. Moderate livestock grazing, ranging from .05 AUM per acre to .15 AUM per acre in intensity, combined with rest will help maintain these acres. This rest rotational coverage will promote plant diversity, nutrient cycling, and cover. Controlling or eliminating noxious weeds that reduce the abundance and diversity of native forbs in the sagebrush/grassland habitats is important. Mechanical treatments will be considered in small areas to increase grass and forb components of the site. Monitoring the response of the flora and fauna will aid in assessing the success of the tools applied and help improve these methods.

3. **Objective:** Manage the remaining 10,225 acres of sagebrush/grassland uplands based on a better understanding of Refuge habitats, wildlife usages, and affected variables using best management practices.

**Strategies:**

- Complete upland habitat inventory by 2008 if financial resources are available.
- Conduct research and monitor outcomes of Refuge upland habitats over the next 15 years.
- Develop habitat based goals and objectives for the remaining Refuge upland acres (10,000) by 2017.
- Establish upland research plots by 2012 to investigate and monitor upland habitats on the Refuge.
- Use cattle grazing at varying stock rates, seasons, and intensities as a management tool for uplands.
- Use 'rest' of varying lengths of time as a management tool for uplands.
- Develop and implement an integrated pest management plan.
- Use a variety of mechanical treatments of the habitat as a management tool for uplands.
- Develop and implement a prescribed burning program.
- Coordinate with existing projects and research and monitoring efforts in the area.
- Establish research plots to test strategies for habitat manipulations.
- Short-term variations of habitat objectives may be considered, on a case-by-case basis, by Refuge management for important ecosystem projects within North Park.

**Rationale:** In an effort to manage the sagebrush/grassland uplands, an inventory of what the Refuge has is essential. A variety of tools are available to provide a structurally diverse shrub community, with a grass:forb component to support migratory birds and other wildlife species. Livestock grazing, used in moderation, at rates ranging from .05 to .15 AUMs per acre will be used. It is anticipated that approximately 1/3 to 1/2 of the upland areas will be grazed annually, resulting in 450 to 1,200 AUMs of forage being removed. Rest also needs to be used in moderation; too much rest can result in dominate brush communities that prevent herbaceous species from recovering. Grazing used in conjunction with rest can enhance the nutrient cycles, plant regrowth, and plant community diversity. Efforts to control and/or eradicate noxious weeds will help maintain the diversity of plant life required to provide wildlife habitat needs. Mechanical treatments break up the soil and remove a variable percent of the brush species, depending on the coverage, to promote grasses and forbs growth. Historically, frequencies of fire in the upland were low, and they were small, patchy fires. Prescribed burns may be beneficial in some upland sites to control dense stands of sagebrush so that herbaceous species can increase. The use of other upland habitat projects in the area, with range types similar to the Refuge, will help to identify successful methods for manipulation the habitat to reach the objectives. A portion of these sagebrush/grassland upland acres will be used to establish research plots to get a better understanding of how to increase sage height and grass:forb abundance to benefit nesting and wintering sage grouse, songbirds (vesper sparrow, sage thrasher, brewer's sparrow, swainson's hawk) and pronghorn antelope. This information will focus on the tools that might get more acres of uplands into the first two objectives. In working with the entire North Park landscape, some habitat objectives may change to accommodate actions deemed essential elsewhere in the upland habitats of the Park to improve the overall quality of wildlife habitat.

4. **Objective:** Manage North Park Phacelia (*Phacelia formosula*) populations currently known to exist on the Refuge to ensure its continued existence.

**Strategies:**

- Initiate research to understand the plant's life history and develop a management plan.
- Protect and develop a monitoring plan for the existing and future new populations.
- Work with other entities to preserve North Park Phacelia populations throughout North Park.

**Rationale:** The North Park Phacelia is the only known federally-listed endangered plant species on the Refuge. The plant is only found in North Park with several populations scattered across the area. Only two known populations of the plant exist on Refuge lands. Little is known about its life history, so management is limited. Research on the life history of the plant is essential. As part of a partnership approach, information and management techniques will be shared to help ensure the continued existence of the Phacelia and eventually the down listing of the species.

## ***Public Use***

### **General Information**

The 1997 National Wildlife Refuge System Improvement Act (P.L. 105-57) requires that each Refuge be managed to fulfill the Refuge System mission as well as the specific purpose(s) for which the Refuge was established. The Act also declares that compatible wildlife-dependent recreational uses are legitimate and appropriate priority general public uses of the Refuge System. These six uses (hunting, fishing, wildlife observation, photography, environmental education, and interpretation) are to receive enhanced consideration in planning and management over all other general public uses of the Refuge System. These activities receive a special focus because they help foster an appreciation and understanding of wildlife and the outdoors. Wildlife conservation is always the top obligation of national wildlife refuges. However, when compatible, these wildlife-dependent recreational uses are to be strongly encouraged on Refuges. Consequently, these six activities are first in line for the Refuge's available staff and financial resources. Although other public uses may be allowed on Refuges, the process for considering proposed uses, other than priority uses, is more stringent, and these uses must be reevaluated more frequently.

A compatibility determination is required for a wildlife-dependent recreational use or any other public use of a Refuge. A compatible use is one which, in the sound professional judgement of the refuge manager, will not materially interfere with or detract from fulfillment of the Refuge System Mission or Refuge purposes. Compatibility determinations for public uses can be found in Appendix F.

Arapaho public use opportunities are combined into five categories and include:

1. Hunting
2. Fishing
3. Wildlife observation and photography
4. Environmental education and interpretation
5. Other uses

Additionally, cultural resources, research, and partnerships are evaluated. Each public use evaluation contains a specific list of objectives, a list of strategies, and a supporting rationale statement.

***Public Use Goal:** Through wildlife-dependent recreation and education, people of a range of abilities and interests are able to learn of and appreciate the natural resources of this unique high mountain park. Thereby, citizens become better stewards of nature in their own communities and stronger supporters of the Refuge specifically and National Wildlife Refuge System generally.*

## **Hunting**

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| <b>Public Use - Hunting</b> |
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- 1. Objective:** Provide recreational hunting opportunities consistent with Refuge goals and objectives, and that facilitate North Park wildlife management objectives.

### **Strategies:**

- Working with the State, develop a hunting step-down management plan that provides hunting (big game, small game, and waterfowl) opportunities to meet North Park and Refuge objectives.
- Working with the State, provide limited small game and furbearer hunting opportunities depending on Refuge habitat objectives and/or population objectives North Park-wide.
- Hunting of predators will not be authorized in order to minimize disturbance to wildlife. The hunting step-down management plan will reevaluate the role of predator hunting on the Refuge.

- 2. Objective:** The Refuge will work with the State in promoting sound hunting practices as a wildlife management tool.

### **Strategies:**

- The Refuge will partner with the State and North Park Chamber of Commerce for the dissemination of information about hunting opportunities on the Refuge and throughout North Park.
- Hunting brochures and hunting information will be provided to hunters at the headquarters building.
- Assist Colorado Division of Wildlife off-Refuge with law enforcement, hunter recruitment, and hunter education when requested.

3. **Objective:** Facilities will be maintained, and improved as necessary, to provide a quality recreational hunting experience while minimizing resource damage.

**Strategies:**

- Develop five parking areas [Map 9 - Public Use - Alternative B and D (Preferred)] using post and cable methods and minimize resource damage caused by vehicles. Parking areas also provide opportunities to inform the hunting public about rules and regulations.
- Develop two permanent gates that can be locked to minimize resource damage caused by vehicles [Map 9 - Public Use - Alternative B and D (Preferred)].
- Develop a travel management plan that will revegetate two track roads [Map 9 - Public Use - Alternative B and D (Preferred)] not needed for maintenance, law enforcement, hunting access, or other management purposes.
- Develop a signage plan that facilitates the public use, enhances the public's understanding of Refuge management, provides public information and safety, and the Refuge System.

**Rationale:** This alternative recognizes that the Refuge is part of a larger system of lands known as North Park. Given that many wildlife species in North Park migrate on and off the Refuge (waterfowl, elk, mule deer, pronghorn antelope, sage grouse), the Refuge hunting program effects more than just Refuge lands. The key to success is a strong working relationship with sportsman and with the State, and incorporation of Refuge hunting goals and objectives into a hunting step-down management plan. Additional Refuge hunting opportunities (i.e. moose, elk, mule deer) will be determined in conjunction with the community and the State. The Refuge will continue to work with the State in promoting sound hunting practices as a wildlife management tool. Additionally, this alternative suggests we modify and possibly expand existing public use facilities to include emphasis on hunting both on the Refuge and in North Park. The Refuge will engage in partnerships to disseminate information on hunting opportunities throughout North Park. The Refuge may continue to utilize habitat management units A, B, C to provide resting areas for migratory birds and to minimize conflicts between hunters and visitors, and to distribute hunting pressure. However, the A, B, C system may be modified during the development of a hunting step-down management plan.

## **Fishing**

*Public Use Goal: Through wildlife-dependent recreation and education, people of a range of abilities and interests are able to learn of and appreciate the natural resources of this unique high mountain park. Thereby, citizens become better stewards of nature in their own communities and stronger supporters of the Refuge specifically and National Wildlife Refuge System generally.*

1. **Objective:** Where compatible, opportunities for fishing will be provided based on Refuge goals and objectives.

### **Strategies:**

- Encourage brown and rainbow trout fishing opportunities on the Refuge in accordance with State seasons and regulations and Refuge management objectives. Fishing is closed during June and July to protect nesting waterfowl and other riparian nesting species.
- Evaluate angler impacts to Refuge goals and objectives by 2008.
- Work with the State to develop a sport fish step-down management plan by 2008.

2. **Objective:** Where possible, expand fishing opportunities throughout North Park and help promote fishing as a recreational activity.

### **Strategies:**

- Provide fishing information and fishing regulations to Refuge visitors when requested.
- Utilize the Service Partners for Fish and Wildlife Program to improve fishery habitats on public and private lands when requested.
- When requested, assist the State with fisheries planning issues in North Park.
- Assist the State with law enforcement, fishery management, fisheries sampling, fisheries habitat projects, and spawning throughout North Park when requested.
- Partner with others to enhance fishery habitats in North Park.
- Install and monitor Illinois River gauges on the upstream and downstream end of the Refuge to evaluate river flows.

**Rationale:** The above objectives encourage the Refuge staff to not only provide sport fishing opportunities on the Illinois river, but also to partner with the State and others to improve fishery habitats and promote sport fishing opportunities throughout North Park. The Illinois River fishery is influenced by management actions that occur upstream of the Refuge. Logically, it is important that the Refuge assist, when requested, with habitat projects that impact the Illinois River upstream of the Refuge, and when deemed valuable to Refuge wildlife resources. Similarly, habitats throughout North Park are connected through a system of waterways. Refuge efforts to improve aquatic habitats, when requested, benefit all in North Park. The downside to this strategy involves using very limited personnel and resources on areas other than strictly Refuge grounds that may result in Refuge goals and objectives being delayed or not being met. Partnerships are the key to success when funds and personnel are limited. The Refuge strives to be included as a partner on fishery related habitat improvement projects in North Park.

## Wildlife Observation and Photography

*Public Use Goal: Through wildlife-dependent recreation and education, people of a range of abilities and interests are able to learn of and appreciate the natural resources of this unique high mountain park. Thereby, citizens become better stewards of nature in their own communities and stronger supporters of the Refuge specifically and the National Wildlife Refuge System generally.*

**Public Use - Wildlife  
Observation and Photography**

1. **Objective:** Enhance opportunities for wildlife observation and photography based on Refuge habitat goals and objectives by 2017.

### Strategies:

- Rebuild Brocker Overlook by 2004.
- Construct multi-use trail from Walden to Brocker overlook by 2008.
- Enhance auto tour route road.
- Maintain Refuge Visitor Center for distribution of information.
- Keep brochures current with updated information.
- Complete and maintain boardwalk section of interpretive nature trail.
- Build moose observation platform by 2005.
- Construct wildlife photography blinds on the auto tour route by 2006.
- Establish use limitations for wildlife observation and photography based on habitat goals and objectives.
- Maintain and potentially modify existing facilities to reflect new management strategies.

**Rationale:** Current visitation to the Refuge ranges from 7,000 to 9,000 visits (visit is defined as a person crossing the Refuge boundary). Many opportunities to enhance viewing and photography of wildlife while maintaining habitat goals are available. Each strategy should be designed to facilitate a quality experience for the visitor while fulfilling Refuge goals and objectives.

2. **Objective:** Assist with funding, construction, and program development to enhance wildlife photography and observation in North Park.

### Strategies:

- Develop and disseminate information on the best wildlife observation and photography opportunities throughout North Park.
- Partner with the CDOW plus others to construct and provide observation facilities for moose and other desirable species.
- Pursue funding and partners to assist with the construction of viewing/photography blinds at various other locations in North Park.
- Assist partners with revising the "Watching Wildlife in North Park" guide by 2006.
- Create partnerships with other wildlife-oriented organizations and individuals.

**Rationale:** Recreation plays a major role in the economy of North Park. Wildlife viewing and photography are key factors in the recreational opportunities available. Enhancing these uses will be beneficial to the economy as well as creating a better understanding of wildlife and its habitats.

## **Environmental Education/Interpretation**

*Public Use Goal: Through wildlife-dependent recreation and education, people of a range of abilities and interests are able to learn of and appreciate the natural resources of this unique high mountain park. Thereby, citizens become better stewards of nature in their own communities and stronger supporters of the Refuge specifically and National Wildlife Refuge System generally.*

**Public Use -  
Environmental Education /  
Interpretation**

1. **Objective:** Work with partners, including the North Park School District, to provide opportunities and facilities to conduct five environmental education programs a year, based on Refuge habitat goals and objectives.

### **Strategies:**

- Work with partners to develop specific environmental education programs covering:
  - ✓ habitat management practices and principles;
  - ✓ the natural history of North Park;
  - ✓ agricultural and wildlife;
  - ✓ the life history of various local species including waterfowl, sage grouse, elk, and moose;
  - ✓ North Park and its importance to Colorado waterfowl;
  - ✓ how a Refuge comes into existence and what its role is;
  - ✓ water issues and needs.
- Use existing environmental education opportunities as they occur, such as the water carnival, bird banding, Refuge field trips, and Day in the Woods.
- Create programs for students and volunteers to assist in management tasks for service learning.

2. **Objective:** Incorporate the Refuge and its niche in the North Park landscape in other environmental education messages developed in the county.

### **Strategies:**

- Partner with other land management agencies, non-government organizations, local schools and private individuals to expand the network of environmental education programs and facilities in North Park.
- Hire an outdoor recreation planner to conduct outreach and education activities on the Refuge and North park.

3. **Objective:** Update Refuge interpretive message to reflect recent wildlife issues and concerns (elk, sage grouse), habitat based decision-making, local agricultural uses and how they are not mutually exclusive on or off the Refuge.

**Public Use -  
Environmental Education /  
Interpretation cont'd.**

**Strategies:**

- Replace signs on the kiosks, overlooks, trails and visitor center, and pamphlets, and update the Refuge website to reflect a message of the Refuge working for wildlife and county-wide environmental interests.
- Rehabilitate the Case Barn and develop an interpretive site there presenting the relationship between the county's ranching history and wildlife.
- Interpret prehistoric cultural resources of the Refuge in relation to natural resources found in North Park.

4. **Objective:** Incorporate the Refuge and its niche in the North Park landscape in other interpretive messages developed in the county.

**Strategy:**

- Partner with other entities in the development of interpretive material involving the land management of North Park to identify the role of the Refuge.

**Rationale:** Arapaho National Wildlife Refuge is located almost in the geographic center of North Park. It is known to most residents as a major part of the county landscape, but exactly what the Refuge does and how it contributes to that landscape is not fully understood. Similarly, most out-of-county visitors do not understand how the lands surrounding the Refuge compliment its wildlife-oriented goals. An outdoor recreation planner position will facilitate integration of environmental education at the Refuge and in Jackson County schools. Articulating the story of history of North Park and how the Refuge and the surrounding lands benefit each other will be beneficial to all interests.

## **Other Uses**

1. **Objective:** Compatible, non-wildlife-dependent uses will be allowed, but limited to less sensitive areas based on habitat goals and objectives.

### **Strategies:**

- Eliminate walking leashed dogs, picnicking, horseback riding, and bicycling along roads.
- Use law enforcement, signs, information, and brochures to minimize impacts of other non-wildlife-dependent public uses.
- Prepare and implement a travel management plan to minimize vehicle impacts to Refuge habitats by 2006.

2. **Objective:** Consider non-wildlife-dependent public uses and their benefits to North Park and its residents.

### **Strategies:**

- With Partners, design and construct the Case Barn interpretive loop by 2008. Incorporate North Park and Refuge history and the preservation of wildlife habitats as a theme in the interpretation.
- Encourage partners to be sensitive to wildlife needs when developing recreational opportunities in North Park.
- Continue to allow the Colorado Department of Transportation to plow snow windbreak along Highway 125, subject to a compatibility determination.

3. **Objective:** Allow compatible, non-wildlife-dependent uses that support the Refuge mission.

### **Strategies:**

- Continue operation of the rifle range to facilitate law enforcement firearms requalification for Refuge officers, Colorado Division of Wildlife officers, and other local law enforcement agencies on request.
- Identify and prioritize non-Refuge mineral rights within Refuge boundaries by January 2005.
- Acquire, on a willing-seller basis, priority mineral rights by 2010.
- Continue operation of the Allard gravel pit to support both Refuge and county roads (on-Refuge) requirements.

**Rationale:** Compatible, non-wildlife-dependent uses should be limited to less sensitive areas based on habitat goals and objectives. The Refuge views mineral resource development as having negative impacts on wildlife habitat. Non-federally owned minerals within the Refuge boundary must be identified and purchased, on a willing-seller basis, to minimize future resource damage. The rifle range will continue to operate as it already facilitates Refuge and North Park law enforcement needs. The travel management plan must meet Refuge compatibility determination standards, facilitate management and public use requirements. The Allard gravel pit supports Refuge and county roads (on Refuge) and will remain active to support Refuge goals and objectives.

## **Cultural Resources**

**Cultural Resources Goal:** *The cultural resources of the Refuge are preserved, protected, and interpreted for the benefit of present and future generations.*

## **Cultural Resources**

1. **Objective:** Identify existing Refuge cultural resources and protect from degradation.

### **Strategies:**

- Complete a cultural resources survey, as needed, for management purposes.
- Determine National Register of Historic Places status for the Hampton, Allard, and Case Barns by 2003.
- Protect cultural resources located on the Refuge by minimizing disturbance in sensitive areas.
- When possible, preserve historical records by conducting oral interviews with local residents.
- Apply for monies (grants, maintenance management funds, etc.) to restore and preserve the Case Barn by 2007.
- Support provisions within the Archaeological Resources Protection Act by developing a plan for managing Refuge archaeological resources.

2. **Objective:** Encourage interpretation and protection of cultural resources and their importance to North Park wildlife resources.

### **Strategies:**

- Interpret the Case Barn by extending the tour route to include the barn. Develop an interpretive area adjacent to the Case Barn that discusses its regional significance by 2007. Consider adaptive re-use of the Case Barn in fulfilling the mission of the Refuge.
- Determine historic status of Hampton Barn; make decision to keep or eliminate barn by 2005.
- Interpret history of North Park at the Brocker overlook site by 2004.
- By 2004, develop an interpretive area within the headquarters building that demonstrates connectivity of the Refuge with the remainder of North Park.
- When requested, and dependent on available funding, partner with other individuals and agencies to protect and preserve cultural resources that relate to wildlife throughout North Park.

**Rationale:** A broader cultural resource role needs to be described for the Refuge. The philosophy is to comply with existing cultural resource related laws and policies and to protect Refuge cultural resources from degradation. Additionally, protection and interpretation of cultural resources that relate to North Park wildlife is encouraged. Interpreting the role of ranches in the preservation of habitat can serve as an example for visitors to learn and gain a greater appreciation for wildlife and their habitats.

## **Research**

**Research Goal:** *The Refuge is a learning platform for compatible research that assists management and science of high mountain park sage-steppe communities.*

1. **Objective:** Identify and promote the biological research needed to help achieve the Refuge's habitat goals and objectives.

**Strategies:**

- Identify and prioritize habitat management research needs by 2004.
- Conduct in-house research on priority needs.
- Promote the Refuge research needs within the scientific community. Encourage research that focuses directly on the Refuge's habitat management goals.

2. **Objective:** Identify and promote non-biological research as it relates and contributes to achieving habitat goals and objectives on the Refuge and within North Park.

**Strategies:**

- Identify and prioritize research related to Refuge and North Park wildlife in other disciplines needs by 2004.
- Encourage research in non-biological disciplines that facilitates the Refuge and achieve goals and objectives.
- Allow and encourage research that focuses on natural resource management goals throughout North Park.

**Rationale:** These objectives and strategies focus on identifying and implementing the biological research needs of the Refuge and North Park. Research will focus on achieving the habitat goals and objectives outlined in this Plan. Identified research needs can then be promoted within the scientific community and actively encouraged by Refuge staff. Proposed research, not falling within the categories identified, would generally not be allowed. Conversely, research meeting identified Refuge needs could be supported with funding, lodging, equipment sharing, etc. Disturbance to resident wildlife and habitat is the primary concern. Limiting non-Refuge identified projects will minimize unnecessary disturbance and habitat damage.

## Partnerships

**Partnerships Goals:** *A wide range of partners join with the Fish and Wildlife Service in promoting and implementing the Refuge vision.*

## Partnerships

1. **Objective:** The Refuge will participate in partnerships that promote sound wildlife management.

### Strategies:

- Engage in partnerships that result in wildlife and/or land-health improvements.
- Participate in Habitat Partnership Program, Owl Mountain Partnership, Sage Grouse Working Group, Colorado Wetlands Initiative, Platte/Kansas Rivers Ecosystem team, and others to protect, enhance, or restore wildlife habitats.
- Work with partners to achieve the Refuge goals and objectives.
- Work with the Colorado Historical Society and other partners to restore / rehabilitate the Case Barn Interpretive Site.
- Develop a conservation easement on Pole Mountain property.
- Work with Colorado Land Trust and others to help acquire lands and mineral rights within the Refuge's approved boundaries. Minerals extraction may cause habitat disturbance within the Refuge.

2. **Objective:** Maintain or form partnerships to achieve the wildlife related goals and objectives on the Refuge and within North Park.

### Strategies:

- Promote new partnerships (consider partnering with Ducks Unlimited, Trout Unlimited, Safari Club International, Audubon, Sierra Club, and others) to assist with achieving the Refuge and North Park natural resource goals.
- Strive to develop a Refuge Friends group over the next 15 years.
- Establish a full-time Private Lands Coordinator position to be stationed at the Refuge to assist in wildlife habitat enhancement throughout North Park.

**Rationale:** These objectives and strategies describe the potential level of partnership activity that will improve wildlife habitats throughout North Park. The Refuge staff will form partnerships to promote sound wildlife management within and outside the Refuge. The Refuge will actively participate in partnerships that result in improvements to land health and provide appropriate wildlife habitat in North Park. The Refuge will collaborate with partners on management of critical wildlife habitats in North Park. The private lands position will enable the Service to contribute its biological expertise and resources to private and public landowners when requested.