

## *IV. Management Direction*

### **4.1 Refuge Management Direction: Goals, Objectives, and Strategies**

The mission and purposes of the National Wildlife Refuge System, and the purposes(s) for which a refuge was established are the primary references for setting refuge goals and objectives. The ecosystem priorities provide a secondary reference for setting refuge goals and objectives. Seedskadee National Wildlife Refuge management has established two wildlife, five habitat, and five public use, recreation, and resource protection goals.

Refuge goals are qualitative statements that define what outputs and outcomes a refuge strives for to satisfy the System's mission as well as the refuge's purpose(s). Refuge objectives are defined by the Service manual:

“as milestones which lead to the fulfillment of unit and system purposes. Each objective should be a description of desired and, in most cases, measurable conditions(s) and/or outcomes(s). Objectives should be viewed as targets around which long-range management strategies are developed and with which success can be monitored” (602 FW 2, D(1) (a)). Strategies are techniques employed to achieve objectives.”

The following is a list of the Refuge's goals. These are each described in detail with objectives and strategies in the following sections.

## **Wildlife**

- A1. Threatened and Endangered Species Goal:** *To restore, enhance, or protect threatened and endangered flora and fauna that currently occur or have historically occurred in the area of Seedskadee NWR.*
- A2. Wildlife Goal:** *Preserve, restore, and enhance the ecological diversity and abundance of migratory and resident wildlife with emphasis on native species.*

## **Habitat**

- B1. Riparian Goal:** *Protect and restore riparian habitats along the Green River to provide for the annual life needs of migratory birds and native wildlife utilizing the Green River Basin.*
- B2. Wetland Goal:** *Wetlands will be managed to meet the breeding and migratory requirements of waterfowl, shorebirds, wading birds, and other wetland dependent species.*
- B3. Uplands Goal:** *Preserve, restore, and enhance the ecological diversity of indigenous flora associated with the Great Basin upland desert shrub and grassland habitats to support native wildlife found in the Green River Basin.*
- B4. Riverine Goal:** *The Refuge staff, in collaboration with Wyoming Game and Fish Department and Reclamation, will manage water quality and quantity in the Green River to maintain and/or restore the riparian and cottonwood forests and provide habitat for waterfowl, trumpeter swans, fish, and other native species dependent on river and forested habitat.*
- B5. Invasive Species Goal:** *Restore and maintain indigenous flora diversity by controlling the invasion of exotic plant species on the Refuge.*

## **Public Use, Recreation, and Resource Protection**

- C1. Wildlife-Dependent Recreation Goal:** *Nurture an understanding of and appreciation for wildlife and other natural resources of the Green River Basin by providing opportunities for compatible wildlife-dependent recreation while maintaining the primitive, uncrowded nature of the area.*
- C2. Environmental Education and Interpretation Goal:** *Educate and inform the public about the Refuge, the U.S. Fish & Wildlife Service, The National Wildlife Refuge System, and the Upper Colorado Ecosystem by providing quality environmental education and interpretation opportunities.*
- C3. Resource Protection Goal:** *Protect Refuge resources from adverse natural and/or man-made impacts.*
- C4. Cultural Resource Goal:** *Protect and interpret significant historic and prehistoric cultural sites and objects associated with Refuge lands.*
- C5. Partnership Goal:** *Foster partnerships to promote wildlife conservation and habitat management in the Green River Basin and to help Seedskadee NWR accomplish its vision and goals.*

## **A. Wildlife**

**A1. Threatened and Endangered Species Goal:** *To restore, enhance, or protect threatened and endangered flora and fauna that currently occur or have historically occurred in the area of Seedskadee NWR.*

Bald eagles are increasingly using the Refuge for nesting and 20 to 30 wintering bald eagles use the ice-free areas along the River to hunt. The Refuge will minimize construction and other disturbing activities during critical nesting and wintering periods. These activities will also benefit wintering waterfowl and trumpeter swans. Mountain plovers have been observed in the Dry Creek Unit and circumstantial evidence of nesting has been recorded. Several whooping crane observations have been confirmed on the Refuge. The Service will continue to monitor for these species and evaluate opportunities to provide migration or breeding habitat.

No records exist of the Federally-threatened Ute ladies'-tresses orchid occurring on the Refuge. Intensive surveys in southeast Wyoming have produced a number of new populations. Although, on the fringe of its range, it is possible that small, isolated populations exist on the Refuge. The Service will continue monitoring for this species and protect any found populations.

**A1.1 Bald Eagle Objectives:** The Refuge will provide large mature cottonwood trees (35 to 40 feet, 100 to 150 years old) along the banks of the Green River to serve as nesting, roosting, and hunting perching sites for bald eagles. A total of 1,200 acres of cottonwood habitat will be protected and/or restored. Maintain a minimum of 10 percent of the riparian forest in mature or old-growth timber.

### Strategies:

1. Re-establish cottonwoods at suitable locations by enhancing the natural regeneration, planting seedlings or conducting pole plantings. Suitable sites and methods will be determined by current on-going research.
2. Protect cottonwood trees from damage by beaver, mule deer, moose, cattle, and wildfires.
3. Protect nesting and roosting sites from human disturbances using temporary and/or permanent closures when necessary.
4. Annually monitor bald eagle population trends and reproductive success.
5. Work with Reclamation to manage river flows to maintain open water during the winter months to provide foraging habitat and reduce winter mortality of fish.

**A1.2 Mountain Plover Objectives:** The Refuge staff will investigate managing part of the 3,120-acre Dry Creek Unit as open shortgrass and sagebrush habitat to provide nesting and feeding areas for mountain plovers. The acreage managed for this species will be based on further investigation of its local abundance and distribution and the assessment of current habitat conditions in the Dry Creek Unit. Surveys for plovers will be conducted annually and an assessment of the dry creek habitat should be completed within five years after the CCP is finalized. If appropriate, manage for shrub density of 12.3 m<sup>2</sup>, grass height average of 8.4 cm, average forb height of 4.3 cm, average shrub height of 3.7 cm, percent cover grass (13%), forb (10%), Shrub (10.4%), bare ground (71%), and litter (2%) (Parish 1988, Parish et. al 1993).

Strategies:

1. Nesting habitat will be protected from trampling by domestic livestock and off-road vehicle use by fencing Refuge boundaries and enforcing Refuge regulations.
2. Review historical records and annually survey existing habitats for nesting mountain plovers.
3. Conduct vegetative transects in the Dry Creek management unit to evaluate current habitat conditions relative to the breeding and migratory needs of the mountain plover.
4. Based on habitat and population assessments, implement appropriate management strategies to maintain, improve, or create desired habitat characteristics.

**A1.3 Whooping Crane Objectives:** The Refuge staff will continue to manage wetland units to provide a minimum of 20 percent open shallow wetlands and open shortgrass habitat types. During migration, whooping cranes feed and roost in a wide variety of habitats, including large and small freshwater marshes and submerged sandbars in rivers (Howe 1989, Armbruster 1990, and Kuyt 1992). Approximately 850 acres of wetland will be managed to provide a variety of wetland types as potential feeding sites for migrating whooping cranes.

Strategies:

1. Sections of the Hawley and Hamp wetland unit will be flooded in early spring to a depth ranging from 6 to 36 inches.
2. Wetlands will be managed to accomplish and maintain a cover-water ratio of 50:50.
3. If cranes are sighted on the Refuge, implement an emergency closure in the area the cranes are located to protect cranes from disturbance.

**A1.4 Ute ladies'-tresses Orchid Objectives:** Protect any populations of the federally threatened Ute ladies'-tresses orchid found on the Refuge.

Strategies:

1. Survey any suitable habitat prior to any ground disturbance activities. The plant grows in areas of open vegetation in exposures that heat up with the late summer sun. Most occurrences are along riparian edges, gravel bars, old oxbows, and in moist to wet meadows along perennial stream and springs. Survey suitable habitat during the flowering period (late July - early September). Map any populations found. This species has not been documented in southwest Wyoming.

**A2. Wildlife Goal:** *Preserve, restore, and enhance the ecological diversity and abundance of migratory and resident wildlife with emphasis on native species.*

Seedskaadee Refuge is home to a diverse group of bird and mammal species. One pair of trumpeter swans has nested on the Refuge since 1997 and between 20 to 35 trumpeter swans currently utilize the Refuge as wintering habitat. The State and Service has identified the Refuge as an important component in the restoration of the Rocky Mountain trumpeter swan population. The Service will continue management efforts to maintain and enhance habitat for trumpeter swans.

Moose, mule deer, and antelope herds utilize portions of the Refuge year-round. Hunting of all three species, especially moose and mule deer, is used as a management tool to reduce over-browsing and grazing of Refuge habitats. Hunting is also considered a compatible wildlife-dependent use, thereby fulfilling a priority public use of the Refuge System. The Service will continue close coordination with WYG&F to maintain a balance between watchable wildlife opportunities, hunting opportunities, and healthy habitat conditions.

Sage grouse use the Refuge for wintering and brood-rearing habitat. Nationally, this species has been petitioned for the endangered species list. Information is lacking about the number of grouse using the Refuge and general importance of Refuge habitats to local populations. Additional information is needed to evaluate the role of Refuge lands to management of local populations.

In addition to implementing habitat management actions (discussed in the habitat goals section) that improve and maintain the diverse native plant communities, the Service will consider and implement management regimes that meet various native bird requirements. Biological monitoring of birds and other wildlife will allow management to better document population trends and effects of management actions.

**A2.1 Trumpeter Swan Objectives:** Maintain habitat to accommodate one to three pairs of nesting swans. Breeding pairs require two 100 acre areas and often only one pair nests per pond. Provide wetland ponds with room for take-off (100m); accessible forage (0.3 - 1.2 m depth); diverse submergent and emergent vegetation; muskrat islands or nest platforms; and low human disturbance. Provide winter habitat for 20 to 40 trumpeter swans.

Strategies:

1. Manage the Hawley and Hamp wetland impoundments to provide a mix of tall emergents, submergents, and deep open water habitats (50:50 water to vegetation ratio).
2. Develop a wintering closed area on the Refuge to minimize disturbance to wintering swans and other waterfowl species.
3. Work cooperatively with Reclamation and Wyoming Game and Fish to maintain winter river flows of at least 500 cfs to ensure a majority of the main Green River channel between Fontenelle Dam and Highway 28 remains open (ice-free) to provide foraging and resting habitat for trumpeter swans.
4. Conduct summer monitoring of nesting pairs to determine nesting and fledgling success. Conduct winter monitoring to document numbers and distribution on the Refuge.

**A2.2 Moose and Mule Deer Objectives:** Establish vegetation browse transects in the riparian habitat. Manage herds so that browse transects indicate less than 50 percent browse by moose and deer on cottonwood and willow species. Maintain moose populations at 30-40 animals for the River riparian corridor between the town of Green River and Fontenelle Dam. Maintain a mule deer population of 80 to 100 animals within the Refuge boundary.

Strategies:

1. Establish browse transects to assess current and future habitat conditions.
2. Assist WYG&F with aerial wildlife surveys by providing observers and funds for flights.
3. Coordinate closely with WYG&F to establish hunt seasons and harvest levels.

**A2.3 Sage Grouse Objectives:** Evaluate the importance of Refuge habitats to the local sage grouse populations within the next 5 to 8 years. Maintain or improve nesting, brood, and wintering sage grouse habitat. For nesting habitat, provide mean sagebrush heights of 29 to 36 cm, mean sagebrush canopy cover of 24 to 26 percent, mean grass heights of 15 to 21 cm, and mean grass/forb cover of 5 to 11 percent. For brood habitat, provide mesic shrub sites with an abundance of grasses and forbs. For winter habitat, provide mean sagebrush canopy cover of 15 to 43 percent above snow and mean sagebrush heights of 20 to 56 cm above snow (Connelly et al. 2000).

Strategies:

1. Support research opportunities to evaluate local sage grouse use of the Refuge (populations and use of Refuge habitats).
2. Coordinate closely with WYG&F on sage grouse management initiatives.
3. Initiate Refuge surveys to determine the current amount, location, and timing of sage grouse use.
4. Monitor harvest of sage grouse via field surveys, sign in logs, and wing barrels.

**A2.4 Migratory Bird Objectives:** Determine breeding and migration use of the Refuge for a diversity of migratory and resident bird species within 10 years of completing the CCP. Conduct baseline surveys in each habitat type to determine species richness/diversity and relative abundance. Based on surveys, establish average densities of key indicator species for each habitat type to provide an index to overall species richness/diversity, document population trends of selected species over time, and evaluate the effectiveness of habitat management strategies.

Strategies:

1. Hire a seasonal position for 3 to 5 years to Implement monitoring procedures that provide an index to overall species richness/diversity and document population trends of selected species over time.
2. Conduct predator removal program targeting skunk, raccoon, fox, and mink. Animals would be removed during spring and summer to reduce predation on ground nesting birds.

**A2.5 Other Indigenous Wildlife Species Objectives:** Ensure the diversity and abundance of indigenous mammals, reptiles, amphibians, fish and invertebrates remain intact.

Strategies:

1. Conduct baseline surveys in each habitat type to determine species richness/diversity and relative abundance within 8-10 years of completing the CCP. Compare information to historical data to evaluate changes in species diversity or abundance.

## **B. Habitat**

**B1. Riparian Goal:** *Protect and restore riparian habitats along the Green River to provide for the annual life needs of migratory birds and native wildlife utilizing the Green River Basin.*

Data from several studies indicate that riparian forests on the Refuge are aging; are in poor health compared with upstream forests; have relatively few age classes and, therefore, are becoming simpler in structure; and have insufficient regeneration to establish new age classes. Under these conditions, the existing riparian forested habitat, which is crucial for migrating songbirds, is highly vulnerable and without management intervention, likely to disappear from the Refuge. The Service will develop a plan to outline plausible actions to mitigate this situation. Management actions will emphasize maintaining plant structural and species diversity.

Natural regeneration from seedfall, either by creating artificial off-channel sites or altering flows to create more sites within the historic river channel, is the preferred solution for long-term replacement of cottonwood stands and other woody riparian vegetation. Concerted effort will be put into this potential solution before choosing a widespread planting program. The program will begin with two to three experimental sites in the Dunkle Management Unit which have been selected for their relative ease and reliability of controlled artificial flooding and proximity to cottonwood seed sources. Monitoring of the success of natural regeneration within the historic flood channel is also an important component to gauge the success of this alternative. The Service may implement a protection and planting program which could quickly provide a mid-story vegetative layer for use by forest birds while natural regeneration is proceeding at a slower pace. This step may be more important as an interim solution if natural regeneration is ultimately successful. If natural regeneration is unsuccessful, a broader scale planting program may be critical.

**B1.1 Restoration Plan Objectives:** Within four years of completing the CCP, prepare a Riparian Restoration Plan which determines the potential for restoration of riparian habitat, identifies restoration sites and methods, and estimates costs. Maintain and improve the existing 4,300 acre cottonwood/willow riparian community.

Strategies:

1. Support current riparian restoration research conducted by U.S. Geological Survey and the University of Washington on SeedsKadee NWR to determine potential methods for restoration of habitat degraded by upstream dam operations.

**B1.2 Forest Protection Objectives:** Maintain or improve the vigor of the existing 2,700 acres of woody riparian vegetation which contain a variety of forest canopy types (scattered, open and closed) through floodplain recharge. Provide dense willow understory habitat in parcels greater than five acres in size to provide breeding habitat for neotropical migrant birds. Maintain an average live crown vigor of 75 percent in existing narrow leaf cottonwood stands. Aggressively protect 1,200 acres of mature cottonwood forested areas from drought, wildfire, and wildlife damage.

Strategies:

1. Protect existing woody vegetation and new regeneration from extensive browsing and trampling by native ungulates and livestock. The Refuge staff will use exclosures, chemical deterrents, and management of livestock and wildlife populations in the riparian areas of the Refuge to ensure protection.
2. Work with Reclamation to recharge the floodplain during August in most years, and periodically throughout the growing season in dry years.
3. Install water monitoring wells in riparian areas to monitor underground water tables and evaluate the effects of varying water flows .
4. Wrap or paint mature cottonwood trees to protect from beaver damage. Harvest beaver, when necessary, according to Beaver Trapping Plan.
5. Provide increased wildfire protection by increasing vehicle patrols during periods of high fire danger. Suppress all fires that are detected.
6. Monitor riparian forested communities to determine success of management activities and accomplishment of objectives. Methods may include resampling of green-line transects (1996 Riparian Revegetation Feasibility Study) every 3 to 5 years or the establishment of additional permanent transects/plots using methods described by Scott and Auble during the 1997-1998 Riparian Restoration Studies on the Refuge.

**B1.3 Riparian Regeneration/Planting Objectives:** If required, create a regeneration class of narrow-leaf cottonwood, willows and berry-producing shrubs on 100 acres of early successional riparian habitat through a program of natural recruitment. Achieve narrow-leaf cottonwood regeneration with median seedling densities of 2,500 to 5,000 seedlings per acre and 10 to 20 saplings per acre. Potential sites include the McCullen, Tallman, Pal, Dunkle, Hamp, Otterson, Johnson, and Big Island management units. Initiate a tree and shrub planting program if necessary, at a minimum of 5 suitable locations within the Refuge.

Strategies:

1. Work with Reclamation to manage a flow regime, particularly in years of favorable seed production, suitable for establishment of narrow-leaf cottonwood and willow species during the critical post-seedfall period (July - September). Daily drop in river channel water levels are not to exceed 4 cm/day during the critical period.
2. Determine the feasibility of using abandoned river channels to regenerate cottonwoods.
3. Work with Reclamation, USGS, and other interest groups to determine the flow regime needed to maintain and benefit the regeneration of cottonwoods and willow trees.
4. Prepare a soil survey in areas with suitable regeneration sites.
5. Initiate and monitor a shrub and tree (pole) planting program utilizing live plant materials on suitable riparian sites. Protect plantings, or areas with natural regeneration, from browsing using enclosures.
6. Monitor success of plantings and regeneration efforts.
7. Work with Reclamation to continue mitigation funding for restoration of riparian willow and cottonwood forests until such a time as the decline of this habitat is reversed and the health of the system improves.

**B2. Wetland Goal:** *Wetlands will be managed to meet the breeding and migratory requirements of waterfowl, shorebirds, wading birds, and other wetland dependent species.*

Spring and fall migrational habitats are a very limited resource along the Green River. They consist of secure areas where birds seeking out wetland habitats may feed and rest on their migration through SeedsKadee NWR. Foraging sites are made available in several ways. Shallow flooding of short emergent vegetation in the spring makes a variety of last years seed crops available to ducks and geese. This shallow water also warms much quicker than the river or surrounding deeper wetlands and stimulates invertebrate activity, thereby making them available to waterfowl and shorebirds. Fall migrational habitat is even more limited along the Green River than spring migrational habitat, as most of the naturally-occurring river-fed wetlands have dried up during the summer. Drawing down short emergent wetlands will concentrate aquatic invertebrates and make them available to many species of shore birds and waterfowl.

Maintaining open, deep water areas with submerged aquatic vegetation provides secure loafing and foraging habitat for species like ring-necked ducks, redheads, and trumpeter swans. This type of habitat can be achieved in portions of the Hawley, Hamp, and Sagebrush wetland units. Other migrating and breeding birds prefer shallow flooded emergent wetlands with little open water. Opportunities to provide this habitat type exist in portions of the Pal, Sage brush, Hamp, Hawley, and Dunkle wetland units.

Breeding habitat consists of areas where courtship and breeding may occur, suitable nest sites are available, and adequate resources are provided to sustain birds to fledgling. The Service will strive to manage all wetland units to meet the diverse needs of breeding wetland dependent birds.

Channel downcutting in the Green River has occurred. As a result, many of the historic oxbow river channels are no longer connected to the river and have lost much or most of their wetland values and functions. Prior to Fontenelle Dam these river oxbows would likely flood more often and for longer periods. Dam operations have moderated timing, duration, and volume of peak flows. The Dam has also reduced the amount of sedimentation flowing downstream which in turn reduces the ability of the river to create sandbars and islands. The river channel receives reduced sediments and over the long-term becomes sediment depleted. There is little accretion of the river channel, just erosion, and, therefore, the channel continues to incise. Partial restoration of these old channels can be accomplished by constructing a rock weir in the river and reflooding such channels. Several weir projects have already been completed. Depending upon the micro-relief of the area, these restored channels may provide spring migration, breeding, or fall migration habitats or all of these habitats. Rock weirs do not need to be actively managed other than to maintain the function of the weir to divert water into the channel.

**B2.1 Hamp and Hawley Wetland Units Objectives:** The Hamp, Upper Hawley, and Lower Hawley wetland units will be managed to provide a mix of deep and shallow water habitats depending on unit topography. Management will attempt to maintain a water and cover ratio of approximately 50:50.

Strategies:

1. The Hamp (#1 and #2) head-water gates will be opened in early spring (usually around April 1), and waters will be allowed to seep from Hamp to Lower Hawley unit over a period of three weeks. Approximately 50 percent or more of the units will be flooded to a depth of 2 to 10 inches. The remaining 50 percent (primarily tall emergent aquatic and open submergent) of the units will be flooded to a depth of 2 to 4 feet. Beginning in early August, short emergent vegetation pools will be slowly drawn down to provide fall migration food. Deep water units will remain flooded.
2. Minimize the effect of nest predation on waterfowl and other birds by conducting predator control from mid-March to mid-July according to an approved Predator Control Plan.
3. Monitor waterfowl use bimonthly during spring and fall migrations and nesting success every 3 years. Monitor trumpeter swan use year-round in all wetland units.
4. Drawdowns, burning, mowing, and discing will be used to control encroachment of emergents (cattails) in wetland units. Strive to obtain a cover-water ratio of 50:50: that is to maintain equal portions of open water and emergent vegetation.
5. Waters levels will be manipulated to promote moist soil plants and invertebrate production. Drawdowns and re-flooding will be used to mimic wetland cycles that will produce food (plants and invertebrates) and cover.
6. Maintain existing water rights.
7. Provide areas with minimal disturbance during nesting periods for trumpeter swans and waterfowl. Use temporary/ permanent closures when necessary.
8. Lower the height of three islands constructed in the Hamp Unit to eradicate pepperweed and encourage growth of emergent vegetation. Replace water control structures within unit.
9. Replace or enhance current dike structures in portions of the Hawley unit and replace several worn out water control structures.
10. Evaluate vegetative response to depth, timing, duration, and frequency of flooding.

**B2.2 Sagebrush Pools and Dunkle Wetland Objectives:** Manage the Sagebrush and Dunkle units to optimize fall and spring migration habitat for migrating wetland dependent species by managing for shallow open water (10 to 15 cm) during spring and/or fall migration.

Strategies:

1. In early spring (mid-April to mid-June), Sagebrush Pool and Dunkle wetland units will be drawn down slowly (2-3 cm per week) to concentrate and increase the availability of invertebrates for ducks and early migrating shorebirds. In fall (between August and September), Sagebrush Pool and Dunkle wetland units will be slowly (2-3 cm/week) flooded to a water depth of 18 cm. This will provide foraging habitat for fall migrating birds. Water levels will be increased in these units to approximately 45 cm before heavy freeze, and water will be held in these units through the winter to enable invertebrates to lay eggs and survive over the winter.
2. Units that have undesirable vegetation will be drawn down, shallowly disced in the summer, and shallowly flooded in the fall. Vegetation density in the wetlands will be maintained at less than 50 percent cover.
3. Draw downs, discing, burning, and mowing will be used to promote moist soil plants and invertebrate production.
4. Monitor wildlife use and evaluate vegetative response to depth, timing, duration, and frequency of flooding.
5. Maintain existing water rights.
6. Eliminate the islands currently existing in these units. The islands are too high, infested with perennial pepperweed, and the wetland units are too small to support predator-free islands.

**B2.3 Pal Wetland Objectives:** Manage the Pal wetland unit as a primarily a shallow (<10 cm) wet meadow and willow shrub habitat for a diversity of wetland dependent birds. Wet meadow areas will be no less than 5 acres in size.

Strategies:

1. Drawdowns, discing, burning, and mowing will be used to promote moist soil plants and invertebrate production.
2. Cooperate with Reclamation to enhance wetland management potential in the Pal Wetland Management Unit by re-designing the water delivery system and increasing water control capabilities.
3. Maintain existing water rights.
4. Monitor wildlife use and evaluate vegetative response to depth, timing, duration, and frequency of flooding.

**B2.4 Oxbow Channel Wetlands Objectives:** In cooperation with Reclamation, restore one or more river oxbows to provide riverine wetland habitat which was lost with the construction of Fontenelle Dam. These restored wetlands will provide for spring and fall migration and breeding habitat for waterfowl, shorebirds, and other water birds. Maintain existing oxbow restoration projects.

Strategies:

1. Minimize disturbance to soil surface and utilize existing topography at every opportunity when constructing water delivery systems and dikes.
2. Evaluate the feasibility of constructing a rock weir in the Green River to divert water into a stranded oxbow near Big Island. If feasible, construct a weir to restore the oxbow. Explore other potential oxbow restoration projects in conjunction with the WYG&F and other interested public's.

**B3. Uplands Goal:** *Preserve, restore, and enhance the ecological diversity of indigenous flora associated with the Great Basin upland desert shrub and grassland habitats to support native wildlife found in the Green River Basin.*

The Sagebrush/Salt Desert Shrub habitats provide vital foraging and breeding habitat for sage grouse, pronghorn antelope, neotropical migratory birds, and other indigenous species dependent on these habitats. Sagebrush habitats are not monotypic but, in fact, consist of a mosaic of shrub types of which sagebrush is the most dominant. Most of the Refuge uplands are dominated by this habitat. A unique variety of Wyoming big sagebrush exists in the valley from the upper Green River around Pinedale south to approximately Kemmerer. This variety is extremely palatable to wildlife which may account for the area's ability to support sage grouse, a declining species, and large herds of wintering pronghorn. Maintenance of this sagebrush/ salt desert shrub community is a priority for the Service.

The Hay Farm unit was once planted to a mix of "tame grass" species to be used as irrigated hay for elk feed. When the irrigation was abandoned the area reverted to a mix of grasses and tall annual weedy forbs. Without irrigation it would be very difficult to convert this habitat to a native grass-shrub mix and it provides the only upland tallgrass cover on the Refuge. Following several wildfires on the Refuge, areas previously dominated by solid stands of greasewood were succeeded by vigorous stands of Great Basin wildrye. Tallgrass uplands and wildrye, in particular, are not very abundant on the Refuge and management will seek to maintain or moderately expand these unique vegetation types.

**B3.1 Sagebrush/Salt Desert Shrub Habitat Objectives:** Sagebrush-dominated (15,000 acres) and Salt Desert Shrub (3,000 acres) habitats will be managed for no-net loss and to minimize fragmentation of these habitats. Manage existing sagebrush/ salt desert shrub stands for a balance between shrub and perennial grass cover, and for open to moderate shrub cover (5 to 35 percent) and multiple height classes. Grass and forb canopy cover should be a minimum of 15 percent.

Strategies:

1. Survey upland shrub habitats and evaluate which shrub stands need restoration.
2. Extensively, overly dense and crowded sagebrush stands that have lost much the native herbaceous understory and plant diversity may be selectively thinned to re-establish a balance between shrub cover and perennial grass and forb cover.
3. Upland habitat will be protected from trampling and grazing by domestic livestock and off-road vehicles by maintaining boundary fences and enforcing off-road vehicle regulations.
4. Monitor treatment sites for habitat and wildlife response. Establish long-term monitoring transects/plots in all major upland habitat types to detect changes in cover and major species composition.
5. Aggressively suppress fires which threaten stands of tall sagebrush in draws. These areas provide crucial winter thermal cover for numerous species.

**B3.2 Upland Tallgrass/Great Basin Wild Rye Objectives:** Manage grasslands to maintain shrub cover at less than 10 percent for the improvement and maintenance of habitat for ducks, geese, sage grouse, moose, mule deer, pronghorn, and neotropical migratory birds.

Strategies:

1. Protect grasslands from grazing and trampling by domestic livestock and off-road vehicles by maintaining boundary fences and enforcing off-road vehicle regulations.
2. Survey range and site conditions and inventory vegetation composition.
3. Prescribed burns and mechanical methods, such as discing and mowing, may be used individually or together to achieve grassland objectives.
4. Monitor wildlife and habitat response to treatments. Establish long-term monitoring transects/plots to detect changes in cover and major species composition.
5. Reseed old fields to native grasses and forbs when the composition of native grasses and forbs is less than 50 percent.
6. Initiate several small scale (3 to 10 acres) prescribed burns in decadent stands of greasewood to increase the cover of Great Basin wild rye (up to 50 acres).

**B4. Riverine Goal:** *The Refuge staff, in collaboration with Wyoming Game and Fish Department and Reclamation, will manage water quality and quantity in the Green River to maintain and/or restore the riparian and cottonwood forests and provide habitat for waterfowl, trumpeter swans, fish, and other native species dependent on river and forested habitat.*

Ice-free areas along the Green River are important wintering areas for the Rocky Mountain population of trumpeter swans, waterfowl, and raptors. The trophy trout fishery is also dependent on winter flow management to maintain open water reaches and maintain minimum dissolved oxygen levels. Maintaining open water areas on the Green River during winter is dependent upon climate and flow releases from Fontenelle Dam. The Service will work with Reclamation and WYG&F to provide winter flows to meet these diverse species needs. Providing minimum flows will ensure breeding, foraging, wintering, and migration habitat for native fishes, waterfowl, swans, bald eagles, and other native species.

River management is also instrumental in maintaining the health of the riparian corridor (cottonwoods and willows). Research is currently underway to evaluate the health of the riparian corridor. Recommendations from this research may involve changes in summer river flows to help maintain and rejuvenate the aging cottonwood/ willow forests. In coordination with Reclamation and the WYG&F, the Service will seek to establish summer flows which will facilitate the maintenance and restoration of the riparian corridor.

**B4.1 Riverine Habitat and Fish Objectives:** Work with Reclamation and WYG&F to maintain minimum winter river flows of 500 cfs to ensure the existence of areas in the River that are free of frazil ice and provide open water for wintering wildlife. Strive for winter flows of 700 to 800 cfs. Assure dissolved oxygen (D.O.) level of at least 6.3 mg/l. Strive to ensure that fluctuations do not exceed 100 cfs in a 24-hour period.

Strategies:

1. Establish aquatic vegetation transects to evaluate changes in aquatic vegetation in relation to River management.
2. Cooperate with WYG&F to monitor population trends in roundtail chubs, flannel-mouth suckers, trout, and trumpeter swans.
3. Evaluate the effects of instream river projects on targeted species.
4. Use temporary or permanent closures on the Refuge when necessary to provide areas with minimal disturbance to wildlife.
5. Monitor winter use by wildlife and visitors, including human and wildlife interactions.
6. Work with Reclamation to minimize sudden fluctuations in river flows.
7. Coordinate with USGS to establish standard water quality monitoring sites at 2 to 3 sites within the Refuge to evaluate changes in water quality.
8. Establish invertebrate monitoring sites to evaluate changes in invertebrate abundance relative to changes in River management.

**B4.2 Riparian Corridor Restoration Objectives:** Maintain River flows of a minimum of 500 cfs during summer. Strive for spring flows over 2,000 cfs (April to June), flows of 800 to 1200 cfs from July to October, and winter (November to March) flows of 700 to 800 cfs. Provide a one to two week pulse of 2,000 cfs in late July or August to recharge the floodplain.

Strategies:

1. Work with Reclamation and the WYG&F to evaluate and potentially modify summer river flows with respect to maintenance and restoration of the riparian corridor.

**B5. Invasive Species Goal:** *Restore and maintain indigenous flora diversity by controlling the invasion of exotic plant species on the Refuge.*

The most aggressive control will take place on scattered, new invasive populations. The Refuge staff will regularly update and implement a weed containment plan utilizing Integrated Pest Management practices to reduce the extent of target weed species in riparian/wetland habitats and to prevent their spread to new locations. Much of the wet meadow/short emergent habitats along the middle third of the riparian area (longitudinally along the length of the river) are heavily infested with perennial pepperweed. The short-term strategy is to use mechanical methods (mowing) and herbicides to reduce populations. Efforts have focused from the north refuge boundary working southward. Re-seeding of heavily infested areas may be required. Tamarisk can be readily found in low densities upstream off Refuge lands. Control on the Refuge and cooperative upstream control are both considered essential. This species may be at the limits of its range in this area. The exact potential for invasion and spread here is unknown.

**B5.1 Control Exotic Plant Populations Objectives:** Eradicate or reduce by 90 percent over the next 10 years the frequency of the following noxious plants: perennial pepperweed, Russian knapweed, Canada thistle, musk thistle, salt cedar, and hoary cress.

Strategies:

1. Use fire, herbicides, mechanical methods, and biological control to eradicate or reduce undesirable exotics.
2. In areas where exotic weed control has been conducted, reseed the treated sites to native grasses, forbs, and shrubs.
3. Evaluate effects of noxious plant control, and develop appropriate strategies.
4. Continue to support research into exotic plant control on the Refuge.
5. Network with local noxious plant experts to maintain current information on techniques and practices used to control exotic plants.
6. Develop “watch list” of noxious weed species which occur on the Refuge for use by the staff and volunteers.
7. Annually monitor suitable habitat and known infestations of tamarisk and treat immediately. Coordinate with Reclamation and BLM in the development and implementation of a control program for salt cedar infestations occurring on lands upstream of the Refuge.

## **C. Public Use, Recreation, and Resource Protection**

**C1. Wildlife-Dependent Recreation Goal:** *Nurture an understanding of and appreciation for wildlife and other natural resources of the Green River Basin by providing opportunities for compatible wildlife-dependent recreation while maintaining the primitive, uncrowded nature of the area.*

**C1.1 Wildlife Observation and Photography Objectives:** Provide visitors with quality wildlife observation and photography opportunities. Provide opportunities and minimal facilities for visitors of all abilities to enjoy wildlife-dependent recreation without compromising the quality of the visitor experience or the purpose of the Refuge.

Strategies:

1. Maintain the nine mile west side auto tour route at least twice per year to ensure year-round access for visitors.
2. Maintain and enhance current road pullouts along the auto tour routes. Provide directional signs to indicate parking areas.
3. To improve access to the river and reduce visitor impacts to the river corridor, maintain and enhance the four existing boat ramps on the west side of the River at Dodge Bottom, Hay Farm, Highway 28, and 6 Mile Hill. Install or add additional cable crete to boat ramps to improve launching of boats. Delineate parking areas at boat ramps.
4. Work with the WYG&F to establish a no-wake zone on the Green River through the Refuge.
5. Maintain availability of Refuge lands for miscellaneous occasional compatible public uses (i.e., horseback riding, picnicking, cross-country skiing, snow shoeing, and bicycling) without further expenditure of Refuge resources.
6. Update and convert the existing species list brochure according to the latest Service graphics format.

**C1.2 Hunting and Fishing Objectives:** Provide a variety of quality River fishing opportunities and hunting opportunities on portions of the Refuge.

Strategies:

1. Continue participation in “Take a Kid Fishing Day” and establish at least one additional annual activity for local youth.
2. Meet annually with the WYG&F to determine hunting and fishing opportunities/seasons on Refuge lands.
3. Develop a fishing and hunting leaflet to explain special Refuge regulations and enhance the visitor experience.
4. Modify the existing areas “closed to hunting” and “closed to migratory bird hunting” to improve wildlife observation/photography opportunities, simplify boundaries for hunters, maintain a quality hunt program, and provide better resting/feeding opportunities for migrating birds. The closed area will likely center on the Hawley, Hamp, and Pal wetland management units and include wetland and riverine habitat. Establishment of the new closed area will be in coordination with the WYG&F and with participation of the general public. Barring the establishment of a closed area on Riverine habitat, the Refuge would explore closure of the waterfowl season on December 1 to reduce disturbance to wintering wildlife.
5. Conduct law enforcement patrols to ensure visitors comply with refuge regulations and provide a quality experience for law abiding visitors.
6. Monitor and manage permitted guided use of the Refuge, in accordance with the Recreation Fee Pilot Program. Finalize a “Commercial Guide Plan” for the Refuge. Sections of the River may be closed to commercial guiding in the future to avoid overcrowding.
7. Explore opportunities to offer special hunting and fishing opportunities for persons with disabilities or disadvantaged youth.
8. Install an accessible pit toilet and associated parking area, at Dodge Bottoms boat ramp.
9. Roadside parking areas will be delineated for anglers in high use areas.

**C2. Environmental Education and Interpretation Goal:** *Educate and inform the public about the Refuge, the U.S. Fish & Wildlife Service, The National Wildlife Refuge System, and the Upper Colorado Ecosystem by providing quality environmental education and interpretation opportunities.*

**C2.1 Environmental Education and Interpretation Objectives:**

Seedskaadee NWR will provide a high-quality environmental education and interpretive program for visitors of all abilities to enhance their appreciation and understanding of wildlife and people's role in the environment.

Strategies:

1. Develop one river interpretive canoe trail and provide interpretive brochures to inform and educate boaters about the natural and cultural resources found within the Refuge and the importance of riparian areas in the arid west.
2. Develop and maintain interpretive panels at a minimum of five pullouts along the auto tour route Map 8a & 8b. Interpretive panels will highlight topics such as: river hydrology, habitat management, fishery and wildlife resources.
3. Develop and maintain one nature interpretive trail near the headquarters and one cultural resource trail at the Lombard Ferry site. Trails will include interpretive panels. Trails will be made accessible to visitors of all abilities. Map 8a & 8b.
4. Conduct a minimum of two on-site teacher training workshops that demonstrate activities educators may use to inform students about the Green River and its related natural resources.
5. With the assistance of local educators, develop one environmental education curriculum package for the proposed nature trail.
6. Construct an environmental education/ interpretation facility (6,000 ft<sup>2</sup>) at Seedskaadee NWR and explore partnering opportunities for operating the facility. The facility would include an activity room, interpretive display area, kitchen, rest rooms, and office. Map 8a & 8b
7. Assist schools by conducting limited Refuge environmental education tours as requested.
8. Continue participation in local and State community events like the Green River Fly Swap, Red Desert Sport Show, and Casper Wildlife Expo.
9. Update existing kiosk signs within the next 15 years. Map 8a & 8b
10. Develop and maintain interpretive panels at 5 significant cultural/historical sites.

**C3. Resource Protection Goal:** *Protect Refuge resources from adverse natural and/or man-made impacts.*

**C3.1 Public Use Objectives:** Determine public use levels year-round and monitor impacts to habitat and wildlife via surveys.

Strategies:

1. Continue collection of river registration information at boat ramps. Data will be used to assess if there is a correlation between river uses and habitat impacts and/or wildlife disturbance.
2. Install automatic traffic counters at selected Refuge entrances. Provide visitor sign-in logs at Refuge headquarters and at the Lombard Ferry interpretive site.
3. Monitor River use activities and recreation numbers via remote video to evaluate what type of uses are occurring and locations of uses. Data collected by these means will be used in conjunction with other resource data to analyze impacts to Refuge resources.
4. Develop a Public Use and Sign Plan for the Refuge.
5. Visitor use limits and seasonal closures may be instituted if visitor use levels increase to a level which disturbs wildlife, causes resource impacts, or exceeds visitor tolerances.

**C3.2 Designated Roads Objectives:** Establish designated roads for visitor use which are compatible with the purposes of the Refuge and provides for compatible wildlife recreation opportunities.

Strategies:

1. Reduce fragmentation, damage to habitat types, and disturbance to wildlife by closing select roads which enter sensitive areas. Forty-five miles of designated roads will remain open for public travel if it is determined this does not significantly disturb and/or harm habitat and/or wildlife. Seasonally close 5.4 miles of designated roads on the east side of the River to vehicle use from November 15 through March 15 to reduce disturbance to wintering wildlife utilizing riverine habitat (Map 10).
2. Install numbered road markers at road intersections. These road markers will be depicted on Refuge brochure maps and assist visitors to locate their position on the refuge. Install gates on Refuge administrative roads. Establishment of road markers and gates should alleviate any confusion regarding which roads are open or closed and thus reduce the potential for off-road travel.
3. Close all non-designated roads using a combination of signs, gates, and restoration techniques (ripping and seeding roads).

**C3.3 Refuge Information and Regulations Objectives:** Provide up to date information to visitors about Refuge regulations to ensure compliance and ensure visitor safety.

Strategies:

1. Conduct education and information campaign using news releases and public meetings to gather public comments on proposed changes to refuge management and to inform the public of regulation changes.
2. Update the general Refuge information brochure every two years.
3. Improve directional and regulatory signing on the Refuge to ensure visitors comply with regulations.
4. Ensure information stations located throughout the Refuge are filled regularly with Refuge Brochures (Map 8a & 8b).
5. Provide at least one full time or three collateral law enforcement officers to ensure protection of Refuge resources and public safety.

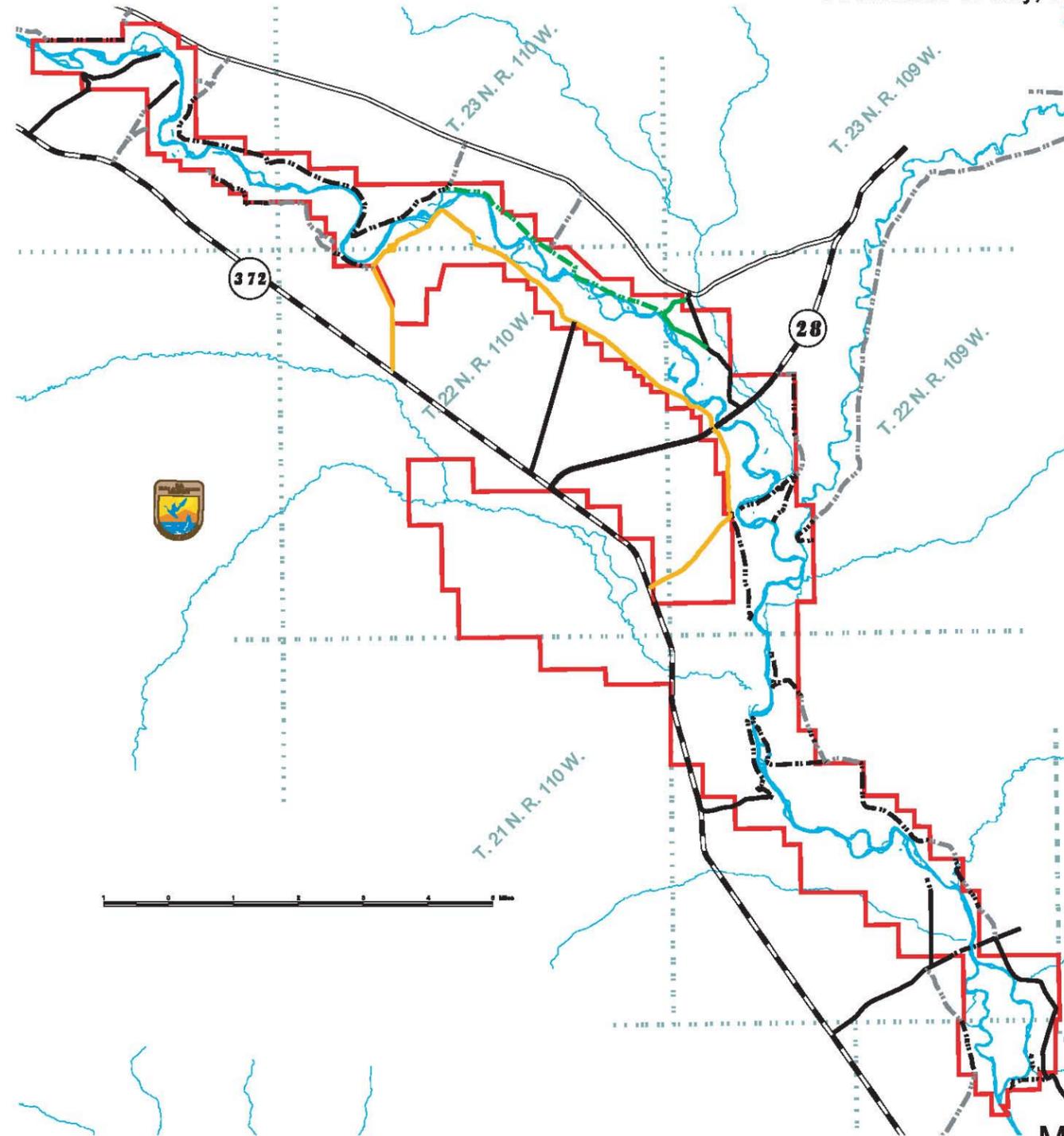
**C3.4 Livestock Management/Fencing Objectives:** Manage livestock access to water in accordance with legal requirements, to minimize impacts to wildlife and habitat, and reduce conflicts with visitors. Maintain fencing around Refuge lands in accordance with WYG&F antelope fence standards.

Strategies:

1. Manage livestock access/watering lanes to minimize conflicts between livestock and Refuge public use. Designate parking areas near livestock watering lanes and create signs informing the public about the purpose of livestock access lanes. (Map 5)
2. Segments of Refuge lands, which are not currently fenced, will be evaluated and, where feasible, they will be fenced. Segments of current fence which are not “antelope-friendly” will be modified to comply with antelope fencing recommendations.
3. Subject to valid existing rights, access to water for livestock would be provided in designated watering lanes only. (Map 5)
4. Providing spring watering opportunities for Rock Springs Grazing Association (RSGA) members will be coordinated as specified by the conditions set forth in the warranty deed which accompanied the sale of the lands from RSGA to the Refuge.

# Seedskadee National Wildlife Refuge

Sweetwater County, Wyoming

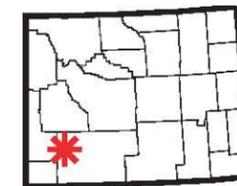


## Legend

- Refuge Roads
- AutoTour
- Improved
- No Maintenance
- No Maintenance (Off Refuge)
- No Maintenance (Seasonal Closure)
- Improved (Seasonal Closure)



## Refuge Location



State of Wyoming

*Draft*

Map#10 Refuge Roads - Alternative 2



**C3.5 Land Acquisition/ Development Objectives:** Protect and acquire lands which support the purposes of the Refuge or mission of the National Wildlife Refuge System.

Strategies:

1. Cluster facility development at the current site of the Refuge headquarters and other buildings and leave the remainder of the Refuge in a primitive and semi-primitive condition. (Map 8a & 8b)
2. The remaining five acres of privately held land within the Refuge boundary would be purchased if there were a willing seller. Other lands would be considered for acquisition on a willing seller basis if information indicated that additional acres were necessary for management of selected species (i.e., threatened and endangered species), to simplify boundary management, or for mitigation purposes. Such areas may include upstream riverine riparian areas, especially between Fontenelle Reservoir and Big Piney or lands surrounding the Big Sandy River. Any additional land acquisition or disposal would go through a public involvement process and be on a willing seller basis only.
3. Conduct a formal review of Refuge lands to determine if portions of the Refuge are eligible for designation as "wilderness."

**C3.6 Mineral and Oil Exploration Objectives:** Minimize impacts/ threats to the Refuge associated with the development of future ROW's and from mining and gas exploration.

Strategies:

1. Mineral exploration and development would be allowed only for privately-owned minerals and under surface use stipulations designed to maximize protection of wildlife, stabilization of soils, and restoration of disturbed vegetation; as well as to minimize adverse effects to the Refuge visitor's experience.
2. No surface occupancy would be allowed for access to privately-owned minerals if they may be otherwise reasonably accessed.
3. Rights-of-way would be reviewed and approved on a case-by-case basis. A right-of-way through the Refuge would be denied if feasible alternative routes were available. If no alternative route were available, restrict right-of-way to existing utility corridors with Refuge stipulations.

**C4. Cultural Resource Goal:** *Protect and interpret significant historic and prehistoric cultural sites and objects associated with Refuge lands.*

**C4.1 Cultural Resource Protection Objectives:** Continue inventorying of Refuge lands for cultural resources and provide quality interpretation and protection of significant sites.

Strategies:

1. Consult with the State Historic Preservation Office prior to all proposed actions.
2. Avoid disturbance to areas of known cultural sites and potential sensitive areas when practical and mitigate any adverse effects to sites. (Map 7)
3. Obtain data and produce a cultural resource overlay for the spatial resource information database (GIS).
4. Incorporate interpretation of the Lombard Ferry replica into the existing Lombard Crossing interpretive site. (Map 7 and 8a)
5. Update the Refuge historical brochure as new information becomes available.
6. Maintain the character of the historic viewshed of the Oregon/Mormon National Historic Trails by minimizing visual impacts during Refuge development.
7. Identify sites for additional protection and interpretation.

**C5. Partnership Goal:** *Foster partnerships to promote wildlife conservation and habitat management in the Green River Basin and to help Seedskadee NWR accomplish its vision and goals.*

**C5.1 Partnerships, Volunteers, and Leadership Objectives:** Create opportunities for new partnerships among Federal, State, and local agencies, organizations, schools, corporations, communities, and volunteers in order to promote and sustain the development and management of the Refuge.

Strategies:

1. Encourage the development of a local “Friends” group to support Refuge goals and assist in future fund raising and cooperative ventures. Potential groups to approach include the Good Sam’s Club, Audubon groups, Trout unlimited, and local school and universities.
2. Encourage the development of a cooperative study between USFWS, BLM, and Reclamation to determine the eligibility and suitability of designating the Green River as a wild and scenic River.
3. Designate a volunteer coordinator to recruit, train, and supervise volunteers.
4. Utilize a variety of sources (web sites, email, university contacts, wildlife and fishery professional societies) to recruit volunteers with diverse backgrounds.
5. Provide room and board if necessary, for volunteers working at the Refuge. Provide at least one bunkhouse with three bedrooms and three trailer pads with RV hookups.
6. Annually evaluate the volunteer program and implement changes when needed.
7. Provide technical assistance on wetland and riparian habitat management and restoration to landowners and land managers.
8. Stay actively involved in other neighboring Federal, State, and private planning processes to protect Refuge resources and foster cooperative management of those resources in the Green River Basin.
9. Continue participation with Trout Unlimited and WYGF to assist with local river improvement projects .
10. Continue or expand opportunities with the Rock Springs, Green River, and Farson Chambers of Commerce to participate in local events, develop websites, and improve dissemination of literature about the Refuge.
11. Continue inter agency coordination with BLM, Counties (Sweetwater, and Lincoln), USFS, WY State Forest Service, Green River and Rock Springs Fire Departments, and National Park Service to assist with wildfire suppression activities.
12. Continue coordination with the American Bird Conservancy (ABC) to publicize the Refuge’s designation as a Globally Important Bird Area. Expand birding opportunities and work with ABC to provide additional funding for bird related habitat improvement or education projects.

