

2 The Refuge



Mike Parker/USFWS

Grass and sage habitats looking east into the Centennial Mountains.

This chapter explains the purposes, establishment, management history, and special values of Red Rock Lakes National Wildlife Refuge, as well as the proposed vision and goals and a discussion of the planning issues.

2.1 ESTABLISHMENT, ACQUISITION, AND MANAGEMENT HISTORY

PURPOSES

Every refuge has a purpose for which it was established. This purpose is the foundation upon which to build all refuge programs, from biology and visitor services, to maintenance and facilities. No action undertaken by the Service or public may conflict with this refuge purpose. The refuge purposes are found in the legislative acts or administrative orders that provide the authorities to either transfer or acquire a piece of land for a refuge. Over time, an individual refuge may contain lands that have been acquired under a variety of transfer and acquisition authorities, giving a refuge more than one purpose. The goals, objectives, and strategies identified in this draft CCP are intended to support individual purposes for which the refuge was established.

The legislative purposes for Red Rock Lakes National Wildlife Refuge include the following:

1. “As a refuge and breeding ground for wild birds and animals.” (Executive Order 7023, dated April 22, 1935)
2. “For use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” (Migratory Bird Conservation Act 1929)
3. “Suitable for (a) incidental fish and wildlife-oriented recreational development, (b) the protection of natural resources, (c) the conservation of endangered species or threatened . . . species . . . The Secretary . . . may accept and use . . . real . . . property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donors.” (Refuge Recreation Act 1962)
4. “The conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions.” (Emergency Wetlands Resources Act 1986)
5. “For the development, advancement, management, conservation, and protection of fish and wildlife resources . . . for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude.” (Fish and Wildlife Act 1956)

ESTABLISHMENT AND ACQUISITION HISTORY

It is impossible to speak of the Red Rock Lakes National Wildlife Refuge history without first addressing some of the history of the Centennial Valley within which the refuge lies.

The Centennial Valley was well known by Native Americans long before the homestead era, as evidenced from the journal writing of explorer Osborne Russell. Upon entering the Centennial Valley in 1835, Russell wrote that the valley from which “flows the head stream of the Missouri . . . was full of Buffaloe when we entered it and large numbers of which were killed by hunters . . . We repeatedly saw signs of Blackfeet about us to waylay the Trappers . . . We stopped at this place to feast on fat Buffaloe.” (Russell and Haines 1965)

In 1876, Mrs. William C. Orr, one of the partners in the P&O Ranch, named this 60-mile long, east-west running valley the Centennial Valley to commemorate the nation’s Centennial. Along with other ranches, the P&O Ranch summered livestock in the valley. In the late 1890s, the Centennial Valley was homesteaded. In addition, the valley, and in particular the area that was to become the refuge, was used by hunting clubs, with people traveling long distances to hunt waterfowl in the area (Beaverhead County History Book Association 1990).

The Centennial Valley provided good seasonal trapping and hunting grounds and was a favored route between the headwaters of the upper Bighole River and the Yellowstone area. The long winters and great distances to market made subsistence difficult at best, with few homesteaders remaining after the Great Depression. Many sold their land back to the Federal Resettlement Administration during the 1930s.

Nearly 100 years after Russell Osborne had entered the Centennial Valley, the Bureau of Biological Survey (a precursor to the U.S. Fish and Wildlife Service) conducted an evaluation and suggested that the area should become a migratory bird refuge. In 1935 Mr. Basyl Kercheval wrote a report and indicated that:

“The economic situation is grave. A large part of the land is mortgaged. Taxes are delinquent in many cases. Livestock in very [sic] instance is mortgaged to various agencies for feed. It is conceded by every one that the Red Rock Lakes area has been the foremost breeding, nesting and resting place for migratory waterfowl with the state of Montana.” (Project of the Bureau of Biological Survey 1935)

On April 22, 1935, President Franklin D. Roosevelt established the Red Rock Lakes Migratory Waterfowl Refuge (later named “Red Rock Lakes National Wildlife Refuge” on July 19, 1961) under Executive Order 7023, “as a refuge and breeding ground for wild birds and animals.” On September 4, 1935, President Roosevelt enlarged the refuge under Executive Order 7172, “provided, that any private lands within the areas described shall become a part of the refuge upon the acquisition of title or lease thereto by the United States.”

During the 70 years since the executive boundary was established, the Service has continued to acquire lands from willing landowners or receive land donations. The Service currently owns 47,756 acres within this approved boundary (see figure 5). Table 2 summarizes the acquisition history and the means of acquisition between 1935 and 2007.

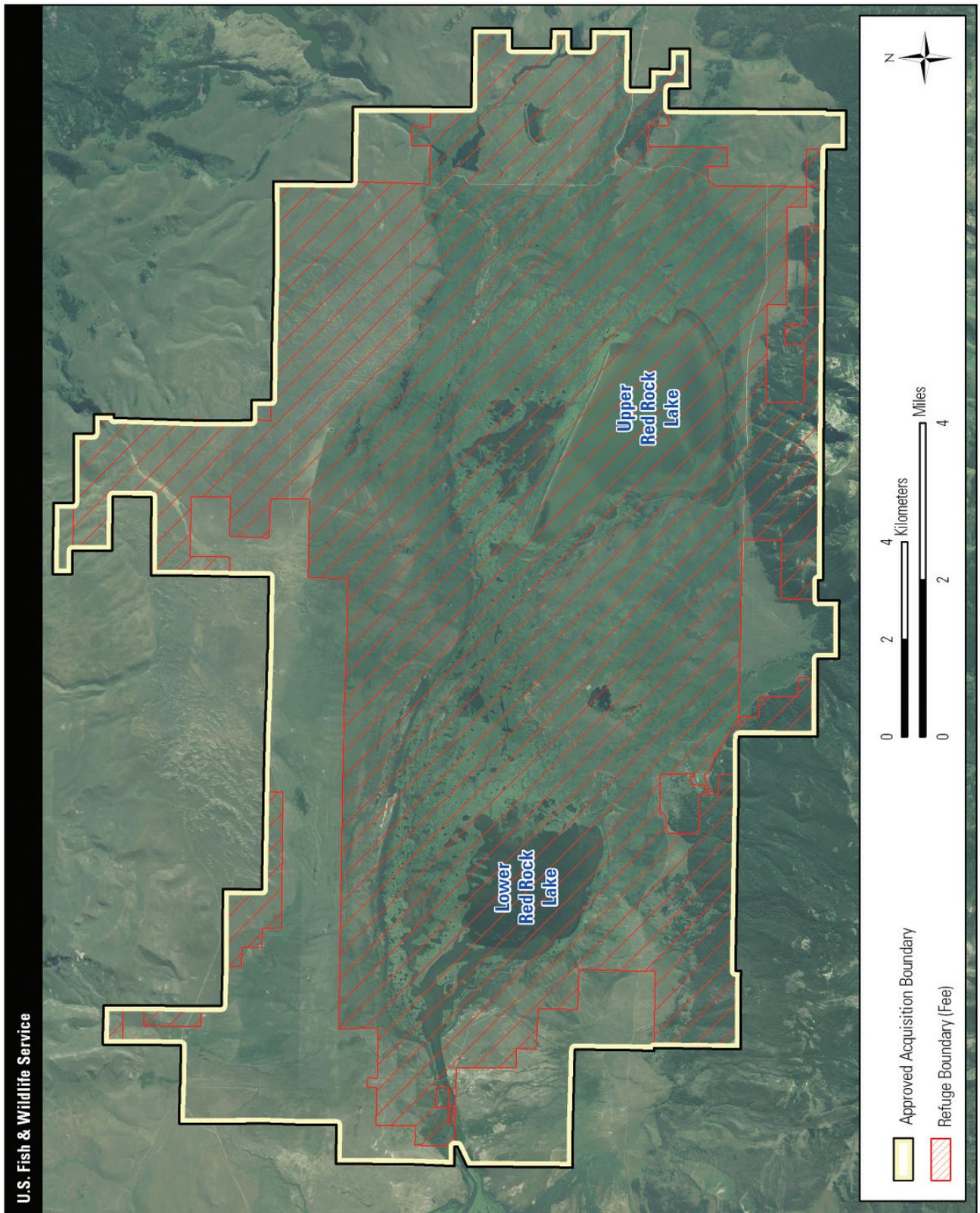


Figure 5. Red Rock Lakes National Wildlife Refuge approved acquisition boundary and acquired lands—refuge base map.

Table 2. Land acquisition history of Red Rock Lakes National Wildlife Refuge, 1935–2007.

<i>Date Acquired</i>	<i>Acres Acquired</i>	<i>Means of Acquisition</i>
4/22/35	9,218	Reserved from Public Domain
4/23/35	594	Reserved from Public Domain
12/2/35	160	Acquired by Resettlement Administration
12/5/35	929	Acquired by Resettlement Administration
12/6/35	212	Acquired by Resettlement Administration
12/7/35	1,912	Acquired by Resettlement Administration
12/12/35	3,209	Acquired by Resettlement Administration
12/17/35	160	Acquired by Resettlement Administration
12/18/35	880	Acquired by Resettlement Administration
12/21/35	1,030	Acquired by Resettlement Administration
12/31/35	480	Acquired by Resettlement Administration
1/14/36	360	Acquired by Resettlement Administration
1/20/36	352	Acquired by Resettlement Administration
1/18/36	254	Acquired by Resettlement Administration
3/3/36	1,033	Acquired by Resettlement Administration
7/30/36	60	Acquired by Resettlement Administration
10/10/36	680	Acquired by Resettlement Administration
4/2/37	320	Acquired by Resettlement Administration
6/10/37	202	Acquired by Resettlement Administration
6/10/37	1,515	Acquired by Resettlement Administration
7/7/37	519	Acquired by Resettlement Administration
8/11/37	231	Migratory Bird Conservation Fund
8/19/37	517	Migratory Bird Conservation Fund

Table 2. Land acquisition history of Red Rock Lakes National Wildlife Refuge, 1935–2007.

<i>Date Acquired</i>	<i>Acres Acquired</i>	<i>Means of Acquisition</i>
8/19/37	254	Migratory Bird Conservation Fund
10/2/37	12	Acquired by Resettlement Administration
11/17/37	1,292	Acquired by Resettlement Administration
5/16/38	3	Acquired by Resettlement Administration
7/18/39	390	Acquired by Resettlement Administration
7/18/39	307	Acquired by Resettlement Administration
7/18/39	3,447	Acquired by Resettlement Administration
7/18/39	648	Acquired by Resettlement Administration
7/18/39	296	Acquired by Resettlement Administration
7/18/39	499	Acquired by Resettlement Administration
7/18/39	820	Acquired by Resettlement Administration
7/18/39	195	Acquired by Resettlement Administration
7/18/39	8	Acquired by Resettlement Administration
7/18/39	398	Acquired by Resettlement Administration
7/19/39	4	Acquired by Resettlement Administration
3/6/40	42	Acquired by Resettlement Administration
2/25/54	1	Migratory Bird Conservation Fund
12/31/56	1	Migratory Bird Conservation Fund
9/30/76	6,855	Other
2/14/79	1	Other
12/15/86	1,673	Land and Water Conservation Fund
2/2/88	431	Land and Water Conservation Fund
2/28/88	120	Land and Water Conservation Fund

Table 2. Land acquisition history of Red Rock Lakes National Wildlife Refuge, 1935–2007.

<i>Date Acquired</i>	<i>Acres Acquired</i>	<i>Means of Acquisition</i>
2/1/90	320	Land and Water Conservation Fund
4/4/90	280	Land and Water Conservation Fund
4/9/90	352	Land and Water Conservation Fund
2/3/91	320	Land and Water Conservation Fund
5/20/91	320	Gifted to the U.S. Fish and Wildlife Service
4/14/94	960	Land and Water Conservation Fund
4/30/97	480	Land and Water Conservation Fund
10/10/99	20	Migratory Bird Conservation Fund
10/11/99	20	Gifted to the U.S. Fish and Wildlife Service
12/15/07	2,159	Migratory Bird Conservation Fund and Federal Land Transaction Facilitation Fund
Total	47,756	

CENTENNIAL VALLEY CONSERVATION EASEMENT PROGRAM

The refuge expanded its conservation efforts in the Centennial Valley in March 2001 through the initiation of a Centennial Valley Conservation Easement Program. This work is outlined in an environmental assessment and land protection plan (USFWS 2001). The purposes of the Centennial Valley Conservation Easement Program are to

- protect native wet meadows, wetlands, uplands, and mountain foothills from future conversions to second and recreational home uses;
- protect habitat integrity by preventing fragmentation;
- preserve key wilderness values and views throughout and adjacent to the Red Rock Lakes National Wildlife Refuge;
- promote landscape integrity in order to maintain, sustain, and enhance the historic plant, animal, and insect biodiversity of native prairie habitats and associated ranching heritage;
- minimize invasive plant infestations from soil disturbance, road building, and increased traffic resulting from rural housing development;

- minimize, to a lesser extent, future demands on local government resources necessitated by providing services associated with increasing rural development.

Today, the refuge manages nine conservation easements for a total of 20,219 acres (see figure 6). Table 3 summarizes the acquisition history of this program since 2001.

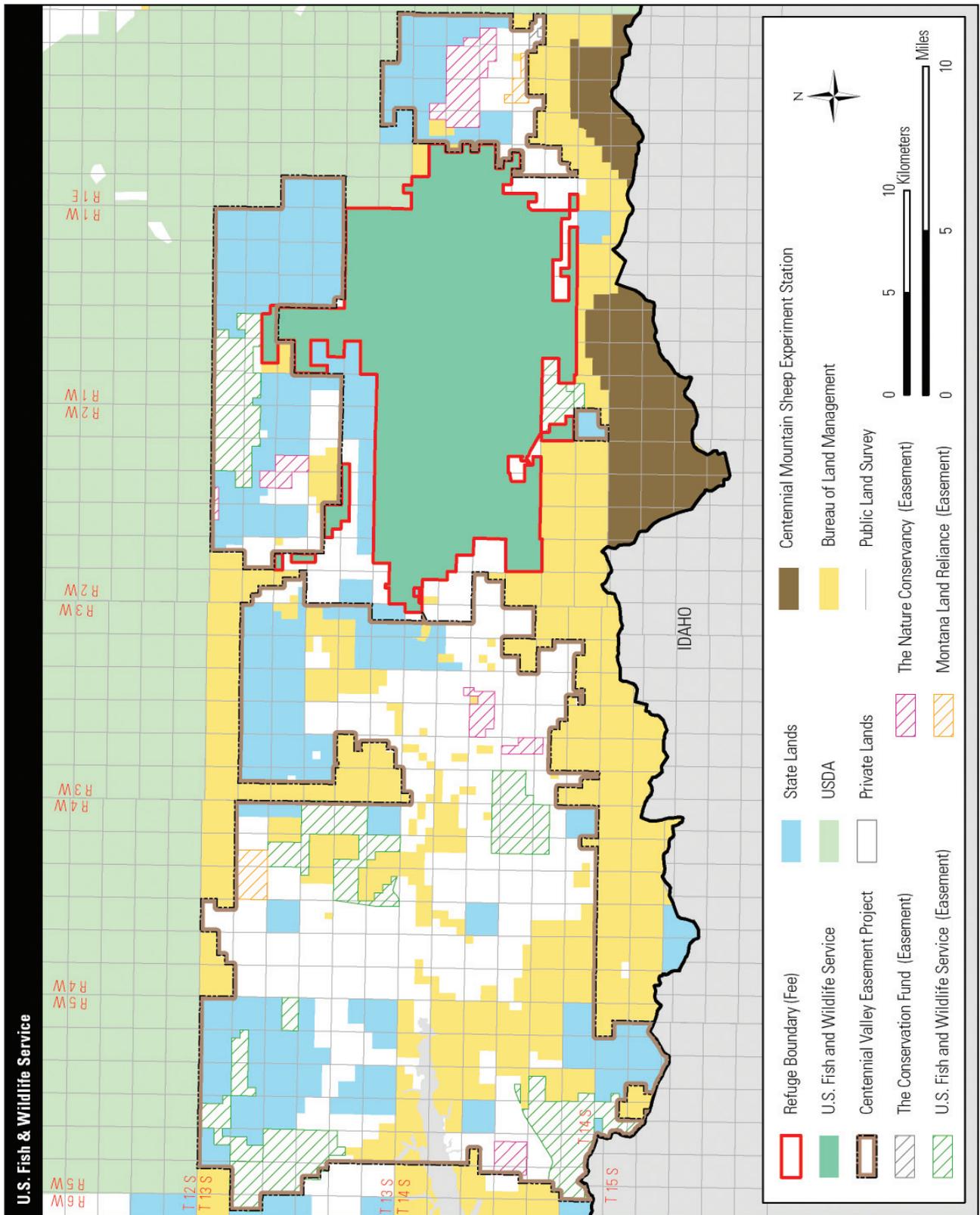


Figure 6. Conservation easements within the Centennial Valley.

Table 3. Conservation easement acquisition history within the Centennial Valley, 2001–2006.

<i>Year Acquired</i>	<i>Means of Acquisition</i>	<i>Total Acres</i>
2001	Land and Water Conservation Fund	2,376
2002	Land and Water Conservation Fund	3,771
2003	Land and Water Conservation Fund	188
2003	Land and Water Conservation Fund	1,361
2003	Land and Water Conservation Fund	640
2004	Land and Water Conservation Fund	990
2004	Land and Water Conservation Fund	3,404
2005	Land and Water Conservation Fund	4,137
2006	Gifted	3,353
Total		20,219

MANAGEMENT HISTORY

Red Rock Lakes NWR is one of the most remote refuges in the lower 48. It is located in the Centennial Valley in southwestern Montana in Beaverhead County, 47 miles west of West Yellowstone and 38 miles east of the town of Lima. This 47,756-acre refuge sits at 6,670 feet above sea level and lies east of the Continental Divide near the uppermost reach of the Missouri drainage.

Historically, management focused on protecting and enhancing the trumpeter swan population at the refuge. In the 1930s the refuge was their last known breeding location. Management actions included hatching eggs, raising cygnets to fledging age, and feeding adult swans during the winter months. Trumpeter swans were studied intensively at the refuge, and much of what is known about their breeding biology was published in *The Trumpeter Swan*, written by former refuge manager Winston E. Banko (Banko 1960). Today, swans can still be seen breeding in the valley, but the intensive management of swan populations (through feeding and raising of young) has been altered in favor of allowing the swans to thrive under mostly natural conditions.

The refuge has one of the most naturally diverse areas in the Refuge System. The refuge boasts the largest wetland complex within the Greater Yellowstone ecosystem, as well as expansive tracts of grassland and sagebrush-steppe habitats and a small amount of midelevation forested areas. These habitats support over 230 species of birds, including peregrine falcons, bald eagles, short-eared owls, sandhill cranes, sage grouse, and numerous species of waterfowl and waterbirds (see “Appendix D: Species List”). Common mammals include Shiras moose, elk, mule and white-tail deer, badger, coyote, and red

fox. In recent years, wolves and grizzly bears have been documented using the refuge. There is also a remnant population of native lacustrine/adfluvial Arctic grayling that occurs on the refuge.

A full-time staff of five employees and various summer temporaries manage and study the refuge habitats and maintain visitor facilities. Domestic livestock grazing and prescribed fire are the primary management tools used to maintain and enhance upland habitats. Currently, four grazing cooperators are using refuge lands. Water level manipulation occurs in some areas of the refuge to improve wetland habitats.

Approximately 12,000 people visit the refuge annually. Two refuge roads and three county roads that pass through the refuge account for the majority of visitor use. Visitors also use the trails at Sparrow Pond and Odell Creek to access the refuge. The refuge is open to limited fishing, with the majority of fishing occurring on Red Rock Creek where anglers can catch Arctic grayling, rainbow trout, Yellowstone cutthroat trout, and brook trout. In addition, the refuge is open to limited hunting of ducks, geese, coots, elk, pronghorn, moose, mule deer, and white-tail deer.

2.2 VISION AND GOALS

VISION STATEMENT

A vision is a concept, including desired conditions for the future, that describes the essence of what the U.S. Fish and Wildlife Service is trying to accomplish at the refuge. The vision for the refuge is a future-oriented statement designed to be achieved through refuge management throughout the life of this

CCP and beyond. The following is the draft vision statement developed by the planning team for Red Rock Lakes National Wildlife Refuge.

The majestic Centennial Valley of southwest Montana is an expansive mosaic of mountain wetlands, grasslands, shrub lands, and forests framed by dramatic mountain peaks. Through partnerships and conservation programs, the valley has maintained its biological integrity and is a working landscape that remains largely undeveloped.

To this end, the Red Rock Lakes National Wildlife Refuge is a conservation leader in the valley working to maintain and restore natural processes to create and sustain native habitat for migratory and resident fish and wildlife. Visitors have a sense of solitude and wildness that lifts their spirits and stirs their souls. This first-hand experience with the refuge encourages people to participate as stewards, not only of the refuge, but also of the natural resources in their own communities

GOALS

The U.S. Fish and Wildlife Service developed a set of goals for the refuge based on the National Wildlife Refuge System Improvement Act, the refuge's purposes, and information developed during project planning. The goals direct efforts toward achieving the vision and purposes of the refuge and outline approaches for managing refuge resources. The Service established six goals for the refuge.

Lake, Pond, and Marsh Habitat Goal—Provide habitat for breeding and migrating birds, native fishes, and resident wildlife that maintains the biological diversity and integrity of montane wetland systems.

Riparian Habitat Goal—Maintain the processes necessary to sustain the biological diversity and integrity of native riparian vegetation for breeding birds, native fishes, and wintering ungulates.

Wet Meadow, Grassland, and Shrub-steppe Habitat Goal—Provide structurally complex native meadow, grassland and shrub-steppe habitats within a watershed context, for sagebrush-dependent species, upland-nesting migratory birds, rare plant species, and other resident wildlife.

Aspen Forest, Mixed Coniferous Forest, and Woodland Habitat Goal—Create and maintain aspen stands of various age classes within a mosaic of coniferous forest and shrub land for cavity-nesting birds and other migratory and resident wildlife.

Visitor Services and Cultural Resources Goal—Provide quality wildlife-dependent recreation,

interpretation, and outreach opportunities that nurture an appreciation and understanding of the unique natural and cultural resources of the Centennial Valley for visitors and local community members of all abilities, while maintaining the primitive and remote experience unique to the refuge.

Refuge Operations Goal—Prioritize for wildlife first and emphasize the protection of trust resources in the utilization of staff, funding, and volunteer programs.

SPECIAL VALUES OF THE REFUGE

Early in the planning process, the planning team and public identified the outstanding qualities of Red Rock Lakes National Wildlife Refuge. Refuge qualities are the characteristics and features of the refuge that make it special, valuable for wildlife, and worthy of refuge status. It was essential to identify these special values and ensure that they are conserved, protected, and enhanced through the planning process. Refuge qualities can be unique biological values, as well as something as simple as, “a quiet place to see a variety of birds and enjoy nature.” There are many attributes that make Red Rock Lakes National Wildlife Refuge unique and valued because it

- is located in the middle of an important wildlife corridor linking the Greater Yellowstone and Bitterroot ecosystems (Merrill and Mattson 2003, Servheen and Sandstrom 1993, Walker and Craighead 1999);
- protects over 62,000 acres of the Centennial Valley in southwest Montana—the least developed valley of its size in the state;
- encompasses the largest wetland complex in the Greater Yellowstone ecosystem;
- contains 3,300 acres of sandhills habitat—one of only two places this habitat can be found in Montana;
- represents one of the most diverse refuges in the contiguous United States, with 45 identified vegetation associations according to the National Vegetation Classification System (Anderson et al. 1998);
- played an integral role in the continental restoration of trumpeter swans;
- continues to provide critical nesting habitat for a tri-state flock of trumpeter swans;
- supports the last native lacustrine/adfluvial population of Arctic grayling in the contiguous United States;
- provides habitat for one of the highest-density wintering moose populations in Montana;
- is in an area that has been a gathering spot for people and wildlife throughout time;
- occurs in an area with rich paleohistory, early exploration, and settlement;

- has historic buildings originally constructed by the Works Progress Administration;
- has potential for a broad range of partnerships that are integral to every aspect of refuge management (that is, hunting, fishing, research, and research);
- provides visitors with a multitude of wildlife-dependent recreational opportunities in a remote, peaceful, beautiful setting;
- encompasses a 32,500-acre designated wilderness area

PLANNING ISSUES

Several key issues were identified following the analysis of comments collected from refuge staff and the public and a review of the requirements of the Improvement Act and NEPA. Substantive comments (those that could be addressed within the authority and management capabilities of the U.S. Fish and Wildlife Service) were considered during formulation of the alternatives for future management. Challenges abound within the National Wildlife Refuge System, and these issues will have to be reviewed, changed, and added to as management actions are put into place and as environmental and social issues interact with refuge purposes and plans.

The key issues identified during this planning process are summarized below.

Habitat And Wildlife Management

Habitat Loss and Fragmentation Caused by Residential Development

Habitat loss is the greatest threat faced by North American wildlife. Maintaining the integrity of existing habitats and providing linkage zones between existing habitats is a key wildlife conservation strategy. Centrally situated between the Greater Yellowstone and Bitterroot ecosystems, two of the most intact, biologically diverse ecosystems in the contiguous United States, the refuge is ideally located to be a conservation leader to protect the Centennial Valley from fragmentation and residential development.

Successful conservation leadership is attained through the development of partnerships. Partnering with conservation partners, local residents, and the Service's Partners for Fish and Wildlife Program, the refuge works to preserve the integrity of the Centennial Valley through conservation easements. These easements prevent further residential or commercial development while fostering the relationships necessary to pursue habitat improvements on adjacent private lands. The refuge also partners with state and other federal agencies and nongovernmental organizations to address local and regional wildlife management challenges. Recent efforts to improve the current status of Arctic grayling in the Red Rock Creek watershed have

led to partnerships with the MFWP, The Nature Conservancy, and U.S. Fish and Wildlife Service Management Assistance Office.

Grazing

Demonstrating good stewardship of refuge lands is another example of how the refuge can be a conservation leader. Managing refuge resources based on the best available knowledge should be the starting point for management actions. This does not ensure success or lack of controversy due to the uncertainties regarding relationships among wildlife, habitat, and management activities. For example, the current grazing program on the refuge draws considerable criticism. It is known that Centennial Valley grasslands evolved with grazing by large native ungulates. The refuge currently provides that disturbance via cattle grazing, a controversial practice on public lands in the American West. While several public comments were supportive of a scientifically-based grazing system designed to benefit wildlife, there was also support for the termination of the grazing program and repatriation of bison on the refuge.

Currently, the refuge has an Upland Management Plan that was written in 1994. The selected alternative was Adaptive Management by Prescription. Although details of how this management alternative would be implemented are described, this plan was never fully actualized. The grazing program is currently run on what is basically a 3-year rest or rotation schedule with very little monitoring of grazing impacts on habitats. In addition, fences have been removed or allowed to deteriorate, resulting in large units that preclude the prescribed "short duration—high intensity" grazing. Changes in the grazing program must take place in order for this to be an effective management tool for habitat manipulation and wildlife benefit.



Sage thrasher.

Red Rock Lakes Management

Wetlands in the Intermountain West provide important habitat for migratory birds and other wetland-dependent wildlife. Similar to wetland habitats in other regions of North America, agriculture and development have resulted in the loss of approximately 57 % of Intermountain West wetlands to drainage. The significance of this loss is magnified due to the region's largely arid landscape. However, management of these habitats is hindered by the relative scarcity of information on the ecology of montane wetlands, making it difficult to predict the response of these habitats to management actions intended to improve habitat quality for migratory birds. Greater understanding of montane wetland ecology would therefore improve the ability of managers to make sound science-based decisions regarding management of these important flyway resources.

“Red Rock Lakes” management is a broad priority encompassing Lower and Upper Red Rock lakes, Swan Lake, the River Marsh, and associated wetland areas. Species (such as swans, ibis, waterfowl, gulls, cormorants, and fishes) using this system of wetlands are inherently included in this priority. Current refuge objectives for wetland habitat management are to mimic disturbance processes believed necessary for maintaining ecological function of montane wetlands. The primary process of management interest is the dynamic wet/dry hydrological cycle, a key driver of wetland productivity and vegetation community structure.

Lower Red Rock Lake and the lower River Marsh have been influenced by a series of water control structures (WCSs) at the western boundary of the refuge since 1930. There are concerns that the WCSs may be negatively affecting the hydrological system of Lower Red Rock Lake and the River Marsh. Increasing temperatures and decreasing precipitation have also raised concerns regarding reduced water resources in the future and the impact on refuge wetland habitats. There is a question as to whether this structure would need to be used as a management tool to capture depleting water resources or if it should be removed.

Arctic Grayling

The restoration of wildlife populations and habitats has been a common theme of the planning process and public comments, and Arctic grayling are a particularly poignant example. The refuge population of Arctic grayling represents the only naturally-occurring lacustrine/adfluvial population in the lower 48 states. Currently, spawning numbers are very low. In addition, Arctic grayling are not spawning in most of their traditional spawning creeks (such as Tom Creek). Spawning only occurs in Red Rock and Odell creeks, putting this population at additional risk.

Shiras Moose

Shiras moose, a subspecies of moose found in Montana, Idaho, and Wyoming, commonly occur on the refuge. The state permits hunting of moose in Montana through a drawing for limited permits, some of which are issued in the unit encompassing the refuge. Numerous comments were received from the public addressing the refuge's moose management and hunting programs. Many believed that moose populations have declined, stating that it is more difficult to view a moose on the refuge than in the past. MFWP winter survey data indicate moose numbers are relatively high and increasing on the refuge. Conversely, recent assessment of key moose habitat on the refuge indicates that there has been a reduction in willow browse intensity. This change in browse activity could be due to an undetected decline of moose or a redistribution of moose during nonwinter periods. Like many ungulates, moose will move into areas that have been recently disturbed by fire. A wildland fire in the Centennial Mountains in 2003 burned over 14,000 acres, stimulating new aspen growth, a favorite food source of moose. If moose are capitalizing on this new growth during the summer, this would lead to their dispersion, a reduction in observation opportunities for visitors, and the perception of an overall decline in moose abundance.

Refuge moose management is coordinated with the state to manipulate harvest for population regulation. Although the refuge comprises only a small proportion of the hunting district, a high percentage (approximately 90%) of moose harvested in the district is taken on refuge lands. Currently, three demes (resident, summer migrants, and winter migrants) are thought to comprise the refuge moose population. A deme is a local population which interbreed and share a distinct gene pool. Basic information regarding population status and trends, population structure, and landscape-level habitat use patterns is needed to assess the possible impacts of current management on both consumptive and nonconsumptive uses on the refuge.

Willow and Aspen Habitats

Herbivory frequently produces a landscape that would not have been created by the physical environment alone. Browsing by large mammalian herbivores can reduce the survival and competitive reproductive capacity of trees and shrubs, resulting in alterations to the structure and dynamics of plant communities. For example, Berger et al. (2001) found willows to be taller and have greater volume where moose densities were limited by predation (in the form of hunting). Similarly, elk overabundance has been linked to reduced regeneration of aspen in the Rocky Mountains (Romme et al. 1995).

Winter surveys conducted by MFWP between 1966 and 2006 show that winter moose abundance in and around the refuge has increased by more

than 2% annually throughout the period surveyed. Elk populations in southwestern Montana have experienced similar population growth. High browse intensity on aspen and willow has been documented in portions of the Centennial Valley, including refuge riparian habitats. This has led to concerns regarding possible impacts on the breeding migratory land bird community. Many western land bird populations are sensitive to diminution of aspen and willow due to their reliance on riparian habitats, and many riparian bird species are experiencing regional declines. Both bird species composition and community diversity in riparian habitats are broadly associated with vertical structural diversity of woody vegetation. The reduction of structural diversity due to high levels of browsing may alter the attractiveness of riparian habitats to some birds.

There is general agreement among managers that browse intensity should be reduced in these habitats. However, there is uncertainty regarding the appropriate means to reach the desired habitat condition for breeding migratory land birds.

Centennial Sandhills

The Centennial Sandhills are one of only two significant sandhill areas in Montana. It is the highest sandhill system in the northern Rocky Mountains. Five plant species found in the sandhills are listed as rare in Montana. Two of these plant species (Idaho painted milkvetch and Idaho evening-primrose) only occur in the Centennial Sandhills and the sandhills located in southeast Idaho. The continued existence of these rare plant species depends on the existence of early successional habitat, which is currently lacking in the Centennial Sandhills on the refuge. Fire and grazing are two tools that may be used to improve conditions for the rare plants. The sandhills also contain rare fauna. Four state mammal species of special concern have been documented: Preble's shrew, black-tailed jackrabbit, Great Basin pocket mouse, and pygmy rabbit. Four Montana Partners in Flight priority II bird species (Casey 2000) also use the sandhill habitat: long-billed curlew, sage thrasher, Brewer's sparrow, and grasshopper sparrow.

While much of the refuge's history has been focused on reducing the negative impacts of human activities on habitats (through reduced grazing and water diversion, elimination of haying), the management of the Centennial Sandhills may take a disparate path. The long-term reduction of disturbances (such as fire and grazing) has resulted in loss of early seral stage habitats, such as blowouts. Early seral sandhill habitat supports a variety of rare flora and fauna. This is evident by the species of plants and wildlife using the heavily-disturbed sandhills found on neighboring lands managed by the Bureau of Land Management. The refuge needs to determine the frequency and intensity of disturbance to achieve a desired mosaic while minimizing impacts on species

such as sage grouse and Brewer's sparrow, both dependent on late-seral sagebrush growth.

Mixed Conifer Management

Woodlands cover approximately 3,745 acres of the refuge. Little or no management has occurred in this habitat. Condition assessments and potential management actions need to be investigated.

Stream Restoration

There are several creeks/streams on the refuge that have been rerouted from their original streambeds. In addition, there are several streams where the riparian habitats have been degraded due to overgrazing, but have not been restored. Restoring these streams would be beneficial to wildlife using the refuge.

Invasive Plant Species

Integrated pest management is an important focus to minimize infestations due to the relatively natural state of the refuge. Although the refuge does have most native plant species represented, some of the areas that have historically been heavily grazed have converted to nonnative grasses, such as Kentucky bluegrass. Other invasive grass species were planted for increased forage, such as smooth brome. While these grasses provide some structure for grassland nesting birds, native grasses are much more desirable for their varied structure and rich nutrients in the seeds they produce. The refuge will be challenged to eradicate these hearty, widespread invasive grasses and restore treated sites.

Wilderness

Over 68% of the refuge (32,350 acres) is congressionally-designated wilderness. This designation recognizes the remote setting and relatively untrammeled nature of the refuge, while protecting these very attributes for future generations. This designation does add complexity to the management of the refuge. Habitat management may seem "inefficient" at times due to wilderness restrictions that prohibit the use of mechanized tools commonly used elsewhere. However, the Wilderness Act was designed to protect the attributes of, and not the efficiencies of managing wilderness areas.

Prescribed Fire Program

There is limited use of prescribed fire on the refuge. Only two burns have been conducted since 2004. A fire management plan (FMP) for the refuge was approved in 2002, but very little work has been done to carry out prescribed fire on the refuge for habitat management.

Visitor Services Program

During the planning process it was clear that many people greatly appreciate the refuge for its wildlife, remoteness, and solitude. Designated both as a National Wilderness Area and National Natural Landmark, the refuge provides quiet, uncrowded wildlife-dependent recreation in a breath-taking setting. Many of the comments supported preserving the pristine character of the refuge.

Overall, many participants and visitors identified a need for greater public understanding and appreciation of the refuge and the recreational opportunities it offers. Many comments included poor directional signage, “unfriendly” boundary signage, inadequate brochures, outdated interpretive panels, confusing regulations, and minimal visitor center information. A number of other recreational issues became apparent during the planning process and deserve further discussion. Specific recreational concerns and issues are summarized as follows.

Hunting

Hunting for waterfowl and big game, including elk, mule and white-tailed deer, pronghorn, and moose, is a popular activity for visitors. Certain portions of the refuge are closed to big game hunting. Waterfowl hunting is limited to Lower Red Rock Lake. The remaining waterbodies are designated as sanctuaries for migratory waterbirds. All hunting seasons (except for moose) follow state regulations and limits. There is no commercial guiding or trapping permitted. Hunting on the refuge is important not only as a wildlife-dependent recreational activity but as a management tool to control large game that become concentrated in protected areas, damaging habitat.

The public expressed many different points of view on whether to permit hunting on the refuge. The greatest concern was over moose hunting. Many commentators believed that the moose population is being impacted by the 11 permits (on average) issued by the state each year for the hunting district in which the refuge is located. Some commentators requested that all moose hunting be stopped.

Overall, there are concerns about what species should be hunted and knowing the refuge’s goals and objectives with respect to management of game species. All commentators agreed that law enforcement is needed to better monitor and regulate this use.

The illegal shooting of game from roads is a major concern on the refuge and in the valley. Because of the expansive views, many hunters drive up and down the road until they find an animal near the road. Instead of giving fair chase and moving off of the road past the right-of-way fence, it has been witnessed several times that the hunter(s) jump out of their vehicles and shoot from the road. Aside from



Laura King/USFWS

The refuge office, one of several historical structures.

being illegal, shooting from the road is unethical and unsafe for other hunters in the field and visitors driving the road.

Fishing

Fishing is a popular recreational activity on the refuge and is permitted on Red Rock, Odell, and Elk Springs creeks and Culver, MacDonald, and Widgeon ponds. Some of the most popular fishing is for nonnative, invasive species such as brook trout, Yellowstone cutthroat trout, and rainbow trout. The habitat alterations on the refuge, such as damming streams to create ponds, have supported these nonnative game fish. These habitat alterations and invasive fish have had a negative impact on the populations of native lacustrine/adfluvial Arctic grayling and Westslope cutthroat trout, both species of concern and found in refuge waters. Fishing these nonnative game fish has become a popular refuge activity. A few public comments requested expanding fishing opportunities on the lakes, creating ponds, and other creeks but imposing restrictive regulations. There are concerns of potential impacts of increasing fishing pressure (especially on Red Rock Creek) on native fish species and the visitor experience.

Wildlife Observation and Photography

The breath-taking scenery and abundant wildlife make wildlife observation and photography two of the most popular visitor service activities on the refuge. Most visitors independently explore the refuge, but many visitors request guidance on the best areas to view wildlife. Many of these areas are along the roads which are not improved for parking. There are two interpreted sites on the refuge, but no interpreted trails. Trails on the refuge and trails to access other public lands are minimal, in poor condition, are not interpreted, or are not listed in the general brochure. The refuge does not have an auto tour route. Numerous comments received during public scoping were in support of identifying hiking trails and other infrastructure to

make wildlife observation and photography easier. Most emphasized that activities should not impact wildlife habitats or wilderness values, including the undeveloped qualities (limited and primitive signs, minimal roads, and abounding wildlife) of the refuge.

Winter time wildlife viewing is particularly challenging, given the extreme winter weather and the unmaintained county gravel roads

Environmental Education, Interpretation, and Outreach

Environmental education programs are almost nonexistent. The closest schools are over 45 miles away and it can be challenging for buses to maneuver the county access roads during the school year. The refuge does not have an outdoor recreation or education specialist, and refuge-specific programs or kits are limited. The refuge's website does provide information about the refuge, its management and resources, and wildlife-dependent recreational opportunities. It does not provide any interactive activities. The refuge's remote location offers minimal opportunities to educate students and about the refuge's purposes, current management programs, issues, and the importance of conserving the Centennial Valley.

The refuge interpretive program is limited. A significant portion of the refuge is wilderness, and to protect the wilderness characteristic of the refuge, signage and trails are limited. There are four kiosks located at the office, entrance areas along county roads, and Upper Lake campground. There are two interpreted sites on the refuge but no interpreted trails. The refuge's general brochure has been updated and meets Service standards. There is a need for an accurate fish and wildlife observation list that meets Service standards. Interpretive displays in the visitor contact area found in the refuge office have recently been updated and expanded to provide information on the refuge's role within the Greater Yellowstone Area and the Refuge System and to acquaint visitors with the natural and recreational resources at the refuge.

Campgrounds

The refuge has two primitive campgrounds, one at Upper Red Rock Lake (Upper Lake campground) and one at Lower Red Rock Lake (River Marsh campground). Although camping is not a wildlife-dependent recreational activity, these campground areas are important for refuge visitors engaged in wildlife observation, photography, fishing, and hunting. The remote location, minimally maintained county road condition, and lack of local lodging facilities have made these campgrounds essential to those visitors who wish to stay for multiple days. Most campground visitors have come to the refuge to bird watch, photograph wildlife, fish, hunt, and hike or bike the Continental Divide trails found in

and around the refuge. There was overwhelming support and concern from the public to keep these campgrounds open. The refuge campgrounds are unique in that they require little maintenance by refuge staff. Visitors keep campsites clean, collect their trash, and cause little disturbance to other campers and visitors.

Cultural Resources

The refuge has only limited inventories of cultural resources, known primarily through investigations initiated by refuge activities that required compliance with Section 106 of the National Historic Preservation Act. The refuge has several historical structures, most of which are still being used, including the refuge office, staff housing, and maintenance facilities. It can be challenging to keep these structures functional while maintaining their historical characteristics.

Law Enforcement

The refuge has no law enforcement staff and is almost 5 hours from the nearest station with region 6 Service law enforcement staff. The refuge has always been a very popular hunting area for both big game and waterfowl. While most visitors respect the refuge and its resources, there will always be those who will "step outside" the laws and regulations. It is very difficult to prevent or respond to these violations without law enforcement staff on-site. The refuge has been contacted by numerous visitors and neighbors reporting suspected violators. The main issues include off-road use, illegal hunting, and trespass. Many public comments identified the need for law enforcement for all visitor service programs to protect wildlife, visitors, and wildlife habitat.

Facilities, Staff, and Administration

The refuge is responsible for managing over 62,000 acres, both in fee title and conservation easements, all within the Centennial Valley. Current staff, funding levels, and facilities available to manage this large land base is inadequate. The refuge currently has a full-time staff of five, including two managers, a biologist, an administrative assistant, and a maintenance worker. Supporting facilities include an office, four refuge houses, one maintenance building, a bunkhouse, and one outbuilding for storage. Although the refuge has been able to conduct many refuge programs through existing resources and partnerships, visitor services programs have been limited, and there have been missed opportunities for greater understanding, conservation, and enhancement of refuge resources. Some of the specific needs include: additional baseline data for some species, more effective management and enhancement of refuge habitats, monitoring of management actions, and orienting and educating visitors. In addition there is no on-site law

enforcement presence to ensure the safety of staff, visitors, wildlife, and facilities.

The refuge headquarters was recently expanded, to provide additional offices and a larger visitor contact area. Interpretive displays are being designed, highlighting the resources and wildlife that use this refuge and the Centennial Valley. Most of the remaining facilities are in need of repair, including the refuge residences, maintenance, other visitor facilities, signs, and fencing. The refuge has several historical structures including the refuge office, fire tower, maintenance buildings, and two refuge houses. These structures are occupied, used daily, and require maintenance to not only keep them functional, but to preserve their historical character and integrity. This can be costly and time-consuming. Universal accessibility can also be an issue with historical structures. Currently, only the office visitor contact area and restrooms are designated as universally accessible. The public also asked for proper maintenance of refuge facilities, but most requested that any changes to the refuges

infrastructure be complimentary to the refuge's rugged, undeveloped character. Due to a lack of private housing surrounding this remote refuge, most current refuge employees rent government housing. There are currently four refuge houses, built between the 1930s and 1950s. The lack of adequate housing has limited the recruitment of added staff and the expansion of refuge programs.

Most refuge roads currently open to the public are in need of repair, some due to failed bridges. Many county roads that provide access through the refuge are not recommended for passenger vehicles due to a lack of regular maintenance and inadequate drainage. There are areas with insufficient visitor parking throughout the refuge.

Directional, interpretive, boundary, and entrance signs are also in need of updating.



Pronghorn are native to the refuge.

