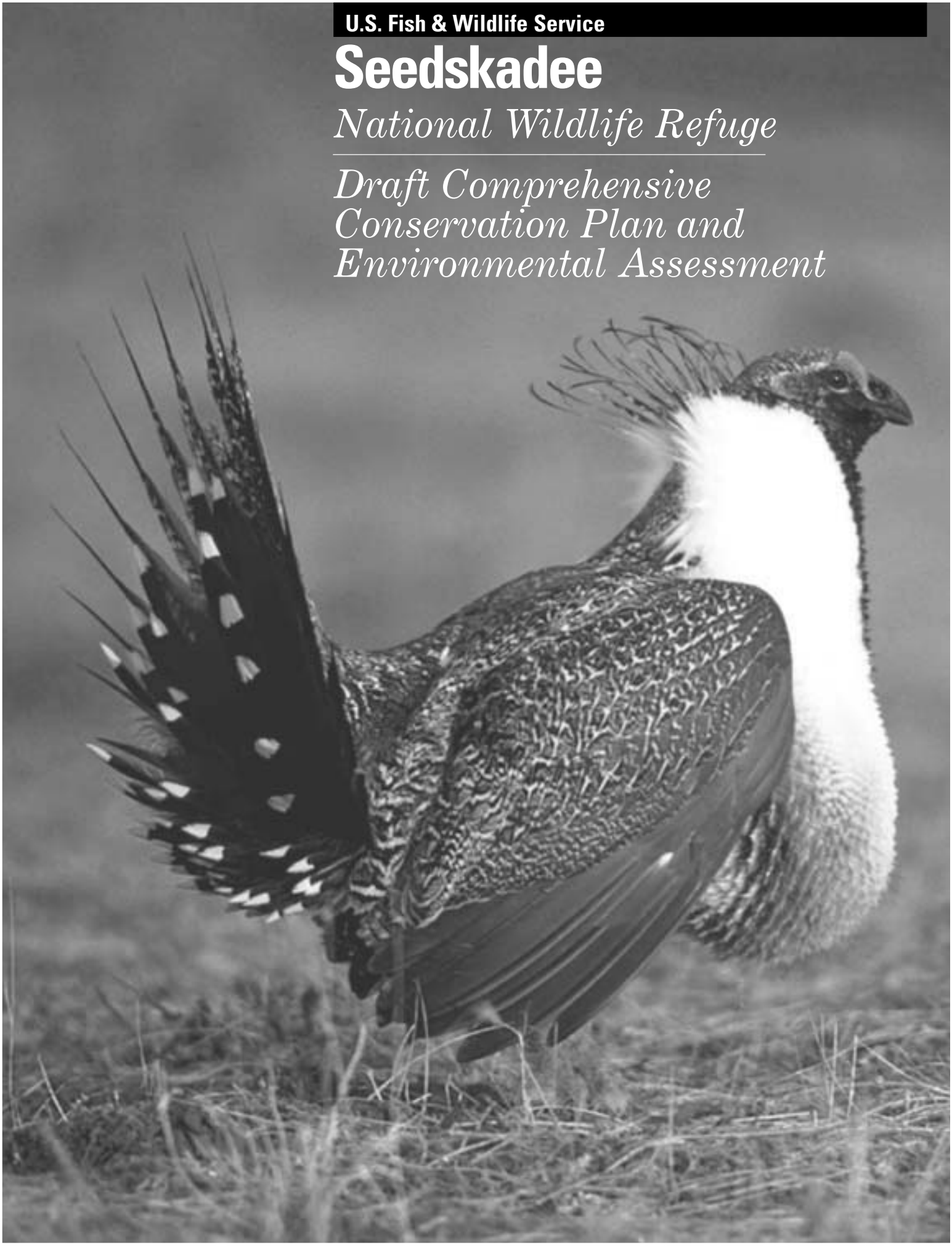
U.S. Fish & Wildlife Service

Seedskadee

National Wildlife Refuge

Draft Comprehensive Conservation Plan and Environmental Assessment



Seedskadee National Wildlife Refuge

DRAFT COMPREHENSIVE CONSERVATION PLAN
and
ENVIRONMENTAL ASSESSMENT

September 2001

Prepared by U.S. Fish and Wildlife Service

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Seedskadee National Wildlife Refuge (NWR) is 26,382 acres in size and located within the Green River Basin in southwestern Wyoming (Map 1). The Refuge is a unique and ecologically important component of the National Wildlife Refuge System (System) which includes more than 530 refuges totaling over 93 million acres across the United States. Seedskadee NWR was established in 1965 through the Colorado River Storage Project Act of 1956. Section 8 of this Act provided for the establishment of wildlife habitat development areas to offset the loss of wildlife habitat resulting from reservoir development in the Colorado River Drainage. The Seedskadee Reclamation Act of 1958 specifically authorized acquisition of lands for Seedskadee NWR.

In 1997, Congress passed the National Wildlife Refuge System Improvement Act. This Act required development of a Comprehensive Conservation Plan (CCP) for each refuge and that management of each refuge be consistent with the CCP. In addition, the Act required that each refuge be managed to fulfill the mission of the National Wildlife Refuge System as well as the specific purposes for which each refuge was established. Seedskadee NWR's purpose is defined by two pieces of Federal enabling legislation. The principal purpose of Seedskadee NWR is to provide for the conservation, maintenance, and management of wildlife resources and its habitat including the development and improvement of such wildlife resources. Additionally, the Refuge is charged to protect the scenery, cultural resources, and other natural resources and provide for public use and enjoyment of compatible wildlife-dependent activities.

The two pieces of enabling legislation are:

1. Fish and Wildlife Coordination Act: ". . . shall be administered by him (Secretary of the Interior) directly or in accordance with cooperative agreements . . . and in accordance with such rules and regulations for the conservation, maintenance and management of wildlife, resources thereof, and its habitat thereon, ..." 16 U.S.C. 664
2. Colorado River Storage Act: ". . . Secretary is authorized and directed to investigate, plan, construct, operate, and maintain . . . (1) public recreational facilities on lands withdrawn or acquired . . ." for the Colorado River project in order to ". . . conserve the scenery, the natural, historic, and archaeologic objects, and the wildlife on said lands, and to provide for public use and enjoyment of the same and of the water areas created by these projects . . . and (2) facilities to mitigate losses of and improve conditions for, the propagation of fish and wildlife." The Secretary may ". . . dispose of . . ." the facilities ". . . to federal . . . agencies . . . upon such terms and conditions as will best promote their development and operation in the public interest." 43 U.S.C 620g

Besides these two pieces of enabling legislation, the thirty-fifth legislature of the State of Wyoming passed enrolled Act No. 54 in 1959 "providing consent of the State of Wyoming to the acquisition by the United States where approved by the Wyoming Game and Fish Commission and the State Land Board, of lands for the establishment of migratory bird refuges." In the Act, the State of Wyoming has consented to the acquisition of up to 20,000 acres of land in Wyoming for the establishment and maintenance of migratory bird refuges in accordance with and for the purposes of the Migratory Bird Conservation Act and the Migratory Bird Hunting Stamp Act. Thus, if ever any of these authorities, and associated funds, were invoked for the acquisition of new lands for Seedskadee NWR, these lands would be managed for "use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (16 U.S.C. 715d) in accordance with the Migratory Bird Conservation Act. To date, all lands acquired have been through Section 8 of the 1956 Colorado River Storage Project Act.

All efforts leading to the preparation of this draft Comprehensive Conservation Plan (CCP) were undertaken to provide the Refuge with: 1) a vision for the future; 2) guidelines for wildlife and habitat management over the next 15 years to ensure progress is made toward attaining the mission and goals of Seedskadee NWR and the Refuge System; and 3) to comply with Congressional mandates stated in the National Wildlife Refuge System Improvement Act of 1997. The CCP planning effort provided opportunities for interested people, Federal and State agencies, State and local governments, and private organizations to give input on future management of the Refuge. This CCP provides clear goals and objectives for management of Refuge habitats, wildlife, threatened and endangered species, cultural and paleontological resources, other compatible public uses, and partnerships. It also provides implementation strategies and recommended staffing and funding.

The Seedskadee CCP will be used to prepare step-down management plans and revise existing plans. It also will be used to prepare budgets which describe specific actions to be taken by the Refuge over the next 15 years. Given that new information, guidance, and technology frequently change and become available, the CCP and/or step down management plans will be updated as necessary throughout the 15-year period. At a minimum the CCP will be reviewed and updated every 15 years.

The draft CCP considers various alternatives for management of Seedskadee NWR. Each of the alternatives was evaluated for environmental consequences in accordance with the National Environmental Policy Act (NEPA). The draft CCP contains the goals, objectives, and strategies found by the Service to best aid the Refuge and the National Wildlife Refuge System to attain their mission. For a summary of the alternatives considered during the planning process, see the Seedskadee NWR Environmental Assessment following the CCP. The CCP is the preferred alternative.

Vision Statement:

Seedskadee NWR will strive to preserve, restore, and enhance the ecological integrity of the Green River riparian corridor and associated uplands as habitat for migratory birds and other indigenous wildlife for the benefit of present and future generations. Seedskadee National Wildlife Refuge will manage for a variety of native plants and wildlife, with emphasis on migratory birds and threatened and endangered species. Natural habitats of the Green River will be preserved or restored. The Refuge will provide interpretation of the natural and human history of the area and provide for wildlife-dependent recreation that is compatible with Refuge purposes. To meet this Vision, the Service will seek partnerships with other agencies, interest groups, landowners, and local communities.

The management focus of the CCP is summarized by the following goals that are supported by a series of objectives and implementation strategies. The goals are:

Wildlife:

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

Habitat:

- 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.
- Wetlands will be managed to meet the breeding and migratory requirements of waterfowl, shorebirds, wading birds, and other wetland dependent species.
- 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 Refuge staff, in collaboration with Wyoming Game and Fish Department and U.S. Bureau of Reclamation (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.
- Restore and maintain indigenous flora diversity by controlling the invasion of exotic plant species on the Refuge.

Public Use and Recreation:

- 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.
- Educate and inform the public about the Refuge, U.S. Fish and Wildlife Service, the National Wildlife Refuge System, and the Upper Colorado Ecosystem by providing quality environmental education and interpretation opportunities.
- Protect Refuge resources from adverse natural and/or man-made impacts.
- Protect and interpret significant historic and prehistoric cultural sites and objects associated with Refuge lands.
- Foster partnerships to promote wildlife conservation and habitat management in the Green River Basin and to help Seedskadee NWR accomplish its vision and goals.

The achievement of these goals and associated objectives will fulfill the mission and purposes of the Refuge and Refuge System.

Potential Refuge Expansion

After the release of the first draft CCP and EA for Seedskadee NWR, Reclamation announced to the Service its intention to dispose of most of the lands acquired under the "Seedskadee Project." Remaining Seedskadee Project lands owned by Reclamation are to be transferred to another Federal agency for management. A portion of the lands available from Reclamation surround the Big Sandy River and adjoin the Refuge.

In this draft CCP we identify interest in amending the Refuge boundary if additional tracts of land become available which would contribute to the Refuge's mission. Included for consideration are lands surrounding the Big Sandy River, a significant tributary that joins the Green River inside the Refuge boundary (see section B3.1 #16, and the EA).

Careful consideration was given to including an analysis in this draft CCP of amending the Refuge boundary to include lands associated with the Big Sandy River. However, the decision was made to not include the Big Sandy analysis in this CCP process for two primary reasons: 1) the CCP is too far along in the review process; and 2) a separate review process, independent of this CCP, would provide a more thorough analysis of any possible land acquisition, including better public scoping and participation in the process. Currently, the Refuge is beginning an internal review to evaluate the feasibility of amending the Refuge boundary to include lands along the Big Sandy River. If a decision is made to pursue a land transfer, a full public process will ensue complete with public involvement consistent with the National Environmental Policy Act (NEPA).

I. Introduction/Background

1.1 Refuge Overview: History of Establishment, Acquisition and Management

1.1.1 Seedskadee NWR Overview

This Comprehensive Conservation Plan (CCP) is being developed specifically for Seedskadee National Wildlife Refuge (Seedskadee NWR or Refuge). Seedskadee NWR is located in southwestern Wyoming, 37 miles northwest of the City of Green River. The Refuge is managed by the U.S. Fish and Wildlife Service (Service) as a component of the National Wildlife Refuge System (Refuge System). The entire Refuge is within Sweetwater County, Wyoming and within the Green River Basin. Geographically, the Refuge is long and narrow, and bisected throughout its length by the Green River. The north boundary of the Refuge is seven miles downstream from Fontenelle Dam. From here, the Refuge extends 37 miles downstream and ranges in width from one to two miles. Total relief within the Refuge is 300 feet. The highest elevation is 6,490 feet near the north end of the Refuge at McCullen Bluff. The lowest elevation is 6,190 feet at the south end of the Refuge, below Big Island. (See Map 1)

1.1.2 History of Seedskadee NWR Establishment, Acquisition, and Management

Seedskadee NWR was authorized by the Colorado River Storage Project Act of 1956 (CRSP). The CRSP authorized and funded construction of Bureau of Reclamation Colorado River storage facilities and related projects including Fontenelle Dam and the Seedskadee Irrigation Project. Section 8 of the CRSP provides for the establishment of wildlife habitat development areas to offset the loss of wildlife habitat resulting from reservoir construction in the Colorado River drainage. The Seedskadee Reclamation Act of 1958 specifically authorized acquisition of lands for Seedskadee NWR. Seedskadee NWR was established on November 30, 1965, through a Memorandum of Understanding between U.S. Bureau of Reclamation (Reclamation) and the Service.

The U.S. Fish and Wildlife Service may acquire lands consistent with legislation, other congressional guidelines or Executive Orders for the conservation of fish and wildlife and their associated habitat and to provide wildlife-dependent public use for education and recreation purposes. Service policy is to acquire lands only when other means of achieving program goals and objectives are not appropriate, available, or effective (USFWS, 341 FW1). In compliance with Section 8 of the Colorado River Storage Project Act, Reclamation is responsible for funding land acquisitions within the Refuge and funding Refuge developments to offset the loss of wildlife habitat resulting from reservoir construction. Since 1958, the Service and Reclamation have worked cooperatively to mitigate the habitat losses. Thus far over 4.5 million dollars have been made available by Reclamation for land acquisition and project development at Seedskadee NWR.

The original Refuge acquisition boundary was designated in Public Land Order 4834 (Federal Register, Vol. 35 - Wyoming 14982) on May 25, 1970, and encompassed 22,112 acres for the mitigation of habitat lost due to the construction of Fontenelle Dam and Reservoir. In the 1990s, the Refuge boundary area increased with the purchase of additional acreage of "uneconomic remnants" and in 1998 when additional acres were acquired from Reclamation withdrawn lands to "roundout" boundary irregularities and improve management opportunities. Today's 1999 boundary includes 26,382.23 acres. All lands are fee title and located within Sweetwater County, Wyoming. Two 2.5-acre privately-owned parcels remain within the boundary of the Refuge. Lands acquired for Seedskadee NWR were all acquired under Section 8 of the 1956 Colorado River Storage Act. No lands have been acquired for the Refuge under the authority of the Migratory Bird Conservation Act or Migratory Bird Hunting Stamp Act.

Table 1.1 Total Acreage

Tract No	Acquired Date	Tract Name	Acres
1-5	11/06/61	Union Pacific Resources Company	3,483.70
1	5/20/70	USA	7,940.76
1	9/10/92	USA	440.77
10	1/28/74	Thoman et al	1,036.05
11	11/30/65	Hawley	916.48
12, a-k	11/26/96	Rock Springs Grazing Assn.	3,366.67
13, a	12/13/95	Crosson Ranches (Pal Tract)	395.84
16	11/26/96	Taliaferro	294.28
17, a-h	4/23/93	UP Land Resources Corp.	3,552.15
2-5	7/30/62	State of Wyoming	719.29
5	6/13/81	Riverside Livestock	160.00
2,aec	8/25/93	State of Wyoming	1,959.24
	1998	USA Roundout (Reclamation to USFWS)	2,117.00
3	9/30/89	Meandered Acres (881.54 acres included in the USA Roundout)	
		Total Acres	26,382.23

Initial mitigation strategies on the Refuge were intended to follow preliminary mitigation concept. This included creation of ponds, other open waters, and wetlands primarily for waterfowl use. However, it proved too costly to install and operate pumps for pond filling, return flows from irrigation use would not have been available, and construction of new diversions, water systems, and dikes would have required extensive planning and budget commitment. Instead, actual development in the 1960s focused on use of pre-refuge diversions and irrigation ditches to develop wetlands. During the next decade, minor dike improvements were made to increase wetland size, but no extensive wetland development or management occurred.

Substantial wetland development did not occur until the 1980s with creation of the Hamp, Hawley, Lower Hawley, and Dunkle water management units. Development of these areas included gravity flow diversions from the Green River and a series of ditches and dikes to create impoundments, marshes, and irrigated wet meadows. These units totaled about 1,700 acres. The Refuge's objectives as stated in a 1987 management plan were:

1. To develop and maintain wetland habitat (primarily as nesting and brood-rearing habitat for Canada geese and other waterfowl).
2. To preserve habitat conditions for the benefit of native wildlife species thus ensuring wildlife diversity in the area, as well as providing habitat for rare and endangered species which frequent the area.
3. To provide opportunities for interpretation and recreation to the visiting public.

About 4,338 acres of riparian area parallel the Green River through the Refuge; however, there has been little management of this resource to date. Upland habitat management has historically centered on habitat protection through fencing and prescribed burning. Fencing of the entire Refuge has been completed. Acreages of existing habitat and locations are described and mapped in the Vegetation and Wildlife Habitat Section.

While the management emphasis at Seedskadee NWR was initially on waterfowl habitat, in recent years there is a growing awareness that the habitat of other migratory and native species dependent on the Green River have been impacted by construction and operation of the Fontenelle Dam. Artificial manipulation of the natural flows of the Green River have reduced sedimentation in River flows and increased down-cutting (incision) of the river channel. This has created negative effects on the health of the riparian forest downstream from Fontenelle Dam. Because these effects were not immediate nor fully anticipated, the extent and implications of the riparian habitat changes were not identified as mitigation targets in initial Seedskadee Project planning. Even now these impacts are not easily quantifiable nor are their implications fully understood for wildlife that are dependent on the riparian river corridor. There is a consensus that Reclamation mitigation actions should continue post Seedskadee Project construction to maintain, enhance, and/or restore riparian habitat downstream of Fontenelle Dam (Auble and Scott, 1998; Bitterroot Consultants, 1996; Berk, 1998).

The Service's management approach to Seedskadee NWR has a broader focus today than anticipated in the 1958 Fish and Wildlife Service Report. Managers today and into the foreseeable future are focused on maintaining quality habitat for migratory and native species which use the Refuge. In addition, when compatible with the Refuge's wildlife and habitat management goals, the Refuge also seeks to provide compatible wildlife-dependent public use opportunities, interpretation and protection of cultural resources, and interpretive and educational information on the Refuge's habitat, wildlife, and cultural resources.

1.2 Purpose of and Need for Comprehensive Conservation Plan

The Service has recognized the need for strategic planning for all the components of the Refuge System. The System is currently comprised of more than 530 refuges and 3,000 waterfowl production areas, totaling approximately 93,604,644 acres (U.S. Fish and Wildlife Service 1999). Seedskadee NWR, located in southwestern Wyoming, is a unique and ecologically important component of this System.

In September 1996, Executive Order 12996 was enacted which gave the System guidance on issues of compatibility and public uses of its land. Congress passed the National Wildlife Refuge System Improvement Act in October 1997. This "organic act," for the first time in the System's history, established the core mission of the Refuge system. Refuge's were to be managed as a system of units dedicated to wildlife and wildlife habitat. As part of this, each Refuge was to prepare a CCP within 15 years.

The CCP planning effort helped the Refuge system address the changing needs of wildlife species and the public. CCP planning efforts provide the opportunity to meet with Refuge neighbors, elected representatives, user groups, and customers, and other agencies to ensure that CCP's are relevant and truly address natural resource issues and public interests. This CCP also explains the planning process, a Refuge's characteristics and purposes, and the direction management will take during the next 15 years to attain the stated purpose of the Refuge.

The purpose for developing this CCP for Seedskadee NWR is to provide the Refuge and the public with a 15-year management plan for the conservation of fish, wildlife, and plant resources and their related habitats found on the Refuge; while providing opportunities for compatible wildlife-dependent recreational uses. The CCP, when completed, will guide the Refuge in meeting its management objectives and contribute to the mission of the Refuge system while meeting all legal mandates.

The Service's goals for the Comprehensive Conservation Planning Process are:

1. To provide a clear and comprehensive statement of desired future conditions (vision) for each refuge or planning unit.
2. To provide a forum for the public to comment on the type, extent, and compatibility of uses on refuges.
3. To ensure that the refuge is managed to fulfill the mission of the System as well as the specific purposes for which it was established.
4. To ensure public involvement in refuge management decisions by providing a process for effective coordination, interaction, and cooperation with affected parties, including Federal agencies, State conservation agencies, Tribal governments, local governments, conservation organizations, adjacent landowners, and interested members of the public.
5. To encourage that we conduct refuge planning in concert with an ecosystem approach.
6. To demonstrate support for management decisions and their rationale by sound professional judgment, biological initiative, and public involvement.
7. To provide a uniform basis for budget requests for operational, maintenance, and capital improvement programs.

1.3 U.S. Fish and Wildlife Service Mission

The U.S. Fish and Wildlife Service manages the National Wildlife Refuge System which is comprised of Federal lands that are acquired and managed for the conservation of fish, wildlife, plants and their habitats. The Service's origins date back to 1871, when Congress established the U.S. Fish Commission to study the decrease of the nation's food fishes and recommend ways to reverse the decline. The Fish Commission eventually evolved into the "U.S. Fish and Wildlife Service" and was located within the Department of the Interior in 1956. The Service's scope of responsibilities broadened throughout the years to include migratory birds, endangered species, certain marine mammals, freshwater and anadromous fish, law enforcement, and national wildlife refuges.

> *Our mission is working with others to conserve, protect, and enhance fish and wildlife and plants and their habitats for the continuing benefit of the American people.*

The Service carries out these responsibilities through several functional entities. The National Wildlife Refuge System is one of those entities.

1.4 National Wildlife Refuge System Mission, Goals, and Guiding Principles

The National Wildlife Refuge System (System) is the world's largest collection of lands set aside specifically for the protection of fish, wildlife and plant populations and their habitats. The first unit of the System was created in 1903, when President Theodore Roosevelt designated 3-acre Pelican Island, a pelican and heron rookery in Florida, as a bird sanctuary.

In 1966, Congress passed the National Wildlife Refuge System Administration Act that assembled the refuges into a unified "System" and codified their administration. This System has grown from 300 refuges totaling 28 million acres in 1966 to today's 530+ refuges in all 50 States and a number of U.S. Territories, and Waterfowl Production Areas in 10 States, totaling over 93 million acres.

However, the Refuge Administration Act did not establish a mission for the System or contain any planning requirements.

On March 25, 1996, President Clinton signed Executive Order 12996, on management and public use of the System. The Executive Order served as the foundation for the permanent statutory changes made by the National Wildlife Refuge Improvement Act of 1997. The Executive Order modified the management direction of Refuges by including provisions for opportunities for six wildlife-dependent recreational uses. The Executive Order recognized "compatible wildlife-dependent recreational uses involving hunting, fishing, wildlife observation and photography, and environmental education and interpretation as priority public uses of the System." These six wildlife-dependent recreational uses are recognized as priority public uses of System lands. These, and other uses, are allowed on refuges only after finding that they are compatible with the purpose of the refuge and the Refuge System. Uses are allowed through a special regulation process, individual special use permits, or sometimes through State fishing and hunting regulations.

Enactment of the National Wildlife Refuge System Improvement Act of 1997 provided the System with a true "organic" act, furnishing a mission for the System, policy direction, and management standards for all Refuge System units.

The mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management and, where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans. (National Wildlife Refuge System Improvement Act of 1997, Public Law 105-

However, the System's importance goes far beyond these services. It contributes directly and indirectly to human welfare through a number of ecosystem services and functions. Chapter 4 contains a detailed discussion of ecosystem services. For the entire biosphere, the estimated annual economic value of all the world's ecosystem services and functions is about $33 trillion (Constanza, *et al.* 1997).

The following broad goals, aimed at fulfilling the System's mission, describe the level of responsibility and concern for wildlife resources as a result of the National Wildlife Refuge System Improvement Act of 1997:

a. *To fulfill our statutory duty to achieve refuge purpose(s) and further the System mission;*
b. *Conserve, restore where appropriate, and enhance all species of fish, wildlife, and plants that are endangered or threatened with becoming endangered;*
c. *Perpetuate migratory bird, interjurisdictional fish, and marine mammal populations;*
d. *Conserve a diversity of fish, wildlife, and plants;*
e. *Conserve and restore, where appropriate, representative ecosystems of the United States, including the ecological processes characteristic of those ecosystems;*
f. *To foster understanding and instill appreciation of fish, wildlife, and plants, and their conservation, by providing the public with safe, high-quality, and compatible wildlife-dependent public use. Such use includes hunting, fishing, wildlife observation and photography, and environmental education and interpretation.*

In addition, individual national wildlife refuges are acquired under a variety of legislative acts and administrative orders and authorities. These orders and authorities usually have one or more purposes for which land can be transferred or acquired. These System units provide important habitat for many native mammals, birds, reptiles, amphibians, fish, invertebrates, and plants. The System also plays a vital role in preserving endangered and threatened species and offers a wide variety of wildlife-dependent public uses. Annually, national wildlife refuges receive 34 million visitors.

Individual refuges provide specific requirements for the preservation of trust resources such as migratory birds. For example, waterfowl breeding refuges in South and North Dakota provide important wetland and grassland habitat to support breeding populations of waterfowl as required by the Migratory Bird Treaty Act and the North American Waterfowl Management Plan. Seedskadee NWR also supports breeding populations as well as providing migration habitat during spring and fall periods. Other refuges in Louisiana and Texas provide wintering habitat for these populations. The network of lands is critical to these birds survival. A deficiency in one location can affect the species and the entire networks ability to maintain adequate populations.

Other refuges may provide habitat for threatened and endangered plants or animals. Refuges in these situations ensure that populations are protected and habitat is suitable for their use. Refuges, by providing a broad network of lands throughout the United States, help prevent species from being listed as threatened or endangered by providing secure habitat for their use and providing recovery habitats in portions or all of a species range.

1.5 Seedskadee National Wildlife Refuge Purpose(s)

Each refuge in the Refuge system is managed to fulfill the mission of the Refuge System as well as the specific purposes for which the refuge was established. Seedskadee NWR's purpose is defined by two pieces of enabling Federal legislation. The principal purpose of Seedskadee NWR is to provide for the conservation, maintenance, and management of wildlife resources and habitat including the development and improvement of such wildlife resources. Additionally, the Refuge is charged to protect the scenery, cultural resources, and other natural resources and provide for public use and enjoyment of compatible wildlife-dependent activities.

The two pieces of enabling legislation are:

1. Fish and Wildlife Coordination Act: ". . . shall be administered by him (Secretary of the Interior) directly or in accordance with cooperative agreements . . . and in accordance with such rules and regulations for the conservation, maintenance and management of wildlife, resources thereof, and its habitat thereon, ..." 16 U.S.C. 664
2. Colorado River Storage Act: ". . . Secretary is authorized and directed to investigate, plan, construct, operate, and maintain . . . (1) public recreational facilities on lands withdrawn or acquired . . ." for the Colorado River project in order to ". . . conserve the scenery, the natural, historic, and archaeologic objects, and the wildlife on said lands, and to provide for public use and enjoyment of the same and of the water areas created by these projects . . . and (2) facilities to mitigate losses of and improve conditions for, the propagation of fish and wildlife." The Secretary may ". . . dispose of . . ." the facilities ". . . to Federal . . . agencies . . . upon such terms and conditions as will best promote their development and operation in the public interest." 43 U.S.C 620g

Besides these two pieces of enabling legislation, the thirty-fifth legislature of the State of Wyoming passed enrolled Act No. 54 in 1959 "providing consent of the State of Wyoming to the acquisition by the United States where approved by the Wyoming Game and Fish Commission and the State Land Board, of lands for the establishment of migratory bird refuges." In it, the State of Wyoming is consenting to the acquisition of up to 20,000 acres of land in Wyoming for the establishment and maintenance of migratory bird refuges in accordance with and for the purposes of the Migratory Bird Conservation Act and the Migratory Bird Hunting Stamp Act. Thus, if ever any of these authorities, and associated funds, were invoked for the acquisition of new lands for Seedskadee NWR, these lands would be managed for "use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (16 U.S.C. 715d) in accordance with the Migratory Bird Conservation Act. To date, all lands acquired have been through Section 8 of the 1956 Colorado River Project Storage Act.

1.6 Seedskadee National Wildlife Refuge Vision Statement

Seedskadee NWR will strive to preserve, restore, and enhance the ecological integrity of the Green River riparian corridor and associated uplands as habitat for migratory birds and other indigenous wildlife for the benefit of present and future generations of Americans.

Seedskadee National Wildlife Refuge will manage for a variety of native plants and wildlife, with emphasis on migratory birds and threatened and endangered species. Natural habitats of the Green River will be preserved or restored. The Refuge will provide interpretation of the natural and human history of the area and provide for wildlife-dependent recreation that is compatible with Refuge purposes. To meet this vision, the Service will seek partnerships with other agencies, interest groups, landowners, and local communities.

1.7 Legal and Policy Guidance

National wildlife refuges are guided by the mission and goals of the National Wildlife Refuge System (System), the designated purpose(s) of the Refuge unit as described in the establishing legislation and/or executive orders, Service laws and policy, and international treaties (for a complete list see Appendix E).

Key concepts included in laws, regulations, and policies that guide management of the System include primary versus multiple-use public lands, compatibility, and priority wildlife-dependent recreational activities. Examples of relevant guidance include the National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997, the Refuge Recreation Act of 1962 (50 CFR), Executive Order 12996 (Management and General Public Use of the National Wildlife Refuge System), and selected portions of the Code of Federal Regulations and Fish and Wildlife Service Manual.

The National Wildlife Refuge System Administration Act of 1966, as amended, provided guidelines and directives for administration and management of all areas in the System, including wildlife refuges, areas for the protection and conservation of fish and wildlife threatened with extinction, wildlife ranges, game ranges, wildlife management areas, and waterfowl production areas. Use of any area within the System was permitted, provided that such uses were compatible with the major purposes for which such areas were established.

The National Wildlife Refuge System Improvement Act of 1997 amends the Refuge System Administration Act by including a unifying mission for the System, a new formal process for determining compatible uses on refuges, and a requirement that each refuge will be managed under a Comprehensive Conservation Plan (CCP or Plan). This Act states that wildlife conservation is the priority of the System lands and that the Secretary of the Interior (Secretary) shall ensure that the biological integrity, diversity, and environmental health of refuge lands are maintained. Each refuge must be managed to fulfill the mission of the System and the specific purposes for which it was established. Additionally, this Act identifies and establishes the legitimacy and appropriateness of the six wildlife-dependent recreational uses. These are hunting, fishing, wildlife observation and photography, and environmental education and interpretation. As priority public uses of the System, these uses will receive enhanced consideration over other uses in planning and management. Furthermore, this Act requires that a CCP be in place for each refuge by the year 2012 and that the public have an opportunity for active involvement in plan development and revision. It is Service policy that CCPs are developed in an open public process and that the agency is committed to securing public input throughout the process. This Act amended portions of the Refuge Recreation Act and National Wildlife Refuge System Administration Act of 1966.

Lands within the System are different from other, multiple-use public lands in that they are closed to all public uses unless specifically and legally opened. Unlike other Federal lands that are managed under a multiple-use mandate (i.e., national forests administered by the U.S. Forest Service and public lands administered by the U.S. Bureau of Land Management), the Refuge System is managed specifically for the benefit of fish, wildlife, and plant resources and their habitats. Compatible wildlife-dependent recreation is a legitimate and appropriate general public use of the System.

Compatible wildlife-dependent recreational uses involving hunting, fishing, wildlife observation and photography, and environmental education and interpretation are priority public uses of the System. These uses must receive enhanced consideration over other public uses in refuge planning and management.

Before any uses, including wildlife-dependent recreational activities, are allowed on national wildlife refuges, Federal law requires that they be formally determined to be "compatible."

A compatible use is defined as a use that, in the sound professional judgement of the refuge manager, will not materially interfere with or detract from the fulfillment of the mission of the System or the purposes of the Refuge. Sound professional judgement is further defined as a finding, determination, or decision that is consistent with the principles of sound fish and wildlife management and administration, available science, and resources (funding, personnel, facilities, and other infrastructure), and adherence with applicable laws. If financial resources are not available to design, operate, and maintain an activity, the refuge manager will take reasonable steps to obtain outside assistance from the State and other conservation interests. No refuge use may be allowed unless it is determined to be compatible.

The Service has completed compatibility determinations for Seedskadee NWR (see Appendix D).

The Refuge Recreation Act, as amended, authorized the Secretary to administer refuges, hatcheries, and other conservation areas for recreational use when such uses did not interfere with the area's primary purpose.

Executive Order 12996 (March 23, 1996) identified a new mission statement for the System; established six priority public uses (hunting, fishing, wildlife observation and photography, environmental education and interpretation); emphasized conservation and enhancement of the quality and diversity of fish and wildlife habitat; stressed the importance of partnerships with Federal and State agencies, Tribes, organizations, industry, and the general public; mandated public involvement in decisions on the acquisition and management of refuges; and required identification, prior to acquisition of new refuge lands, of existing compatible wildlife-dependent uses that would be permitted to continue on an interim basis pending completion of comprehensive planning.

1.8 Existing Partnerships

Legal, administrative, policy, and planning guidelines provide the framework within which management activities are proposed, developed, and implemented. This framework also provides the basis for a continued and improved partnership between the Service, Reclamation, and other natural resource agencies.

In compliance with Section 8 of the Colorado River Storage Project Act of 1956, Reclamation is responsible for funding land acquisitions within the Refuge and funding Refuge developments to offset the loss of wildlife habitat resulting from reservoir construction. Since 1958, the Service and Reclamation have worked cooperatively to mitigate the habitat losses. The Service and Reclamation will continue to cooperate in close partnership for the benefit of the natural resources involved. The CCP is a means of assuring those benefits are achieved.

See Chapter 3 for further information on Bureau of Reclamation/Fish and Wildlife Service partnership history on the Seedskadee Project and development of Seedskadee NWR.

The Refuge also works with a variety of other organizations and individuals on natural resource projects including:

- local law enforcement agencies (general enforcement)
- Wyoming Game and Fish (wildlife and fish surveys, habitat management, enforcement, public outreach, public use)
- Sweetwater County weed and pest (invasive species control)
- Trout Unlimited (stream and river restoration, Take A Kid Fishing Day)
- Rural fire protection districts (wildfire suppression)
- Private landowners (partners for wildlife program)
- Universities (research on wildlife, vegetation, public use)
- Wyoming Partners in Flight (bird monitoring)
- Trumpeter Swan Society (swan management)
- Local school districts (environmental education)
- Scout organizations (community and refuge projects)
- Sweetwater County Chamber of Commerce (eco-tourism, special events)
- Big Sandy Working Group (river and riparian restoration)
- Bureau of Land Management (grazing, historical interpretation and restoration, public use)
- Intermountain Joint Venture (coalition partners)
- Rock Springs Grazing Association (livestock grazing management via a contractual agreement)
- Green River Green Belt Committee (wetland restoration)
- Highland Desert Flies (Take a Kid Fishing Day)
- Volunteers (local community folks, Good Sams Club, Student interns)
- USGS (riparian research)

1.9 Potential for Refuge Expansion

After the release of the first draft CCP and EA for Seedskadee NWR, the U.S. Bureau of Reclamation (Reclamation) announced to the Service its intention to dispose of most of the lands acquired under the "Seedskadee Project" - which, among other things, resulted in the creation of the Refuge in 1965. Remaining Seedskadee Project lands owned by Reclamation are to be transferred to another Federal agency for management. A portion of the lands available from Reclamation surround the Big Sandy River and adjoin the Refuge.

In this draft CCP, we identify interest in amending the Refuge boundary if additional tracts of land become available which would contribute to the Refuge's mission. Included for consideration are lands surrounding the Big Sandy River, a significant tributary that joins the Green River inside the Refuge boundary (see section B3.1 #16, and the EA). As stated in this draft document: "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 or for mitigation purposes. Such areas may include . . . lands surrounding the Big Sandy River. Any additional land acquisition . . . would go through a public involvement process and be on a willing seller basis only."

Careful consideration was given to including an analysis in this draft CCP of amending the Refuge boundary to include lands associated with the Big Sandy River. However, the decision was made to not include the Big Sandy analysis in this CCP process for two primary reasons: 1) the CCP is too far along in the review process; and 2) a separate review process, independent of this CCP, would provide a more thorough analysis of any possible land acquisition, including better public scoping and participation in the process.

Currently, the Refuge is beginning an internal review to evaluate the feasibility of amending the Refuge boundary to include lands along the Big Sandy River. The land surrounding the Big Sandy River, which is proposed for disposal by Reclamation, is considered a "study area." Prior to any formal action, the Refuge will complete an internal analysis of these lands and make a recommendation to the Regional Director to pursue, or not to pursue, the transfer of these lands to the Refuge. If a decision is made to pursue a land transfer, a full public process will ensue complete with public involvement consistent with the National Environmental Policy Act (NEPA).

II. Planning Process

2.1 Description of the Planning Process

The development of this CCP was guided, in the beginning, by the Refuge Planning Chapter of the Fish and Wildlife Service Manual (Part 602 FW2.1, November 1996) and later also by the Service's Final Comprehensive Conservation Planning Policy. Key steps include:

1. Planning;
2. Identifying issues and developing a vision;
3. Gathering information;
4. Analyzing resource relationships;
5. Developing alternatives and assessing their environmental effects;
6. Developing management goals, objectives, and strategies;
7. Identifying a preferred alternative;
8. Publishing the Draft Plan and soliciting public comments on the Draft Plan;
9. Review of comments and effecting necessary and appropriate changes to the Draft CCP; and,
10. Preparation of the final CCP for approval by the Region 6 Regional Director, and finally
11. Implementation of the CCP.

During the course of this CCP planning effort, several formal and informal meetings were held to determine the issues relative to Seedskadee NWR. Meetings with Federal agencies, State agencies, and members of the public assisted the Service and Reclamation in identifying most of the natural resource and public use issues.

Issues, concerns, and opportunities were developed early through a scoping process which began on May 31, 1996 and closed October 15, 1996.

On May 31, 1996, invitations and announcements of two open houses, an explanation of Seedskadee NWR directive and purpose, and a request for comments were mailed out to known interested parties. On June 6, 1996, press releases announcing the open houses were mailed to the appropriate media outlets such as KMER Radio, KRKK Radio, KUGR Radio, KSIT Radio, KUWR Radio, Sweetwater County TV, the Green River Star, the Casper Star Tribune, Rocket Miner, Kemmerer Gazette, and the Pinedale Roundup newspapers.

On June 8, 1996, an open house scoping meeting was held at the Seedskadee NWR headquarters; questionnaires and comment sheets were handed out and verbal comments were taken. The open house was held concurrently with the Refuge's "Take a Kid Fishing" day. Thirty-three people attended. On June 10, 1996, the second open house scoping meeting was held from noon to 8:00 p.m. at the Sweetwater County Library in Green River, Wyoming. Eight people attended.

On June 25, 1996, the questionnaire and comment sheet were mailed out to the CCP mailing list. A complete list of all those who were sent information on the Plan can be found in the project file. On July 1, 1996, signs were posted for the Farson Open House. The open house was held on July 17, 1996 from 7:00 p.m. to 9:00 p.m. at the Farson Community Hall. Four people attended.

On July 17, 1996, the Refuge Manager met with the Sweetwater County Commissioners at the Courthouse. On September 3 and 4, 1996, the Green River Refuges staff met to develop draft mission/goals/objectives for Green River Refuges. On September 16, 1996, a press release announcing the final two open houses was mailed to the appropriate media outlets.

On September 25, 1996, an open house in Rock Springs at the White Mountain Library was held from 5:00 p.m. to 7:00 p.m.; six people attended.

On October 1, 1996, a meeting was held with the Lincoln County Commissioners followed by an open house from 5:00 p.m. to 7:00 p.m. at the Lincoln County Courthouse. One person (county planner), in addition to the three commissioners, attended. On November 11, 1996, Seedskadee NWR staff completed a set of "draft management goals and objectives;" these have been submitted to the Service's regional office for review and concurrence.

"Focus Group" meetings at Sweetwater County Library in Green River were held on January 9, 1997, from 7:00 p.m. to 9:00 p.m. to discuss commercial recreation use and public access. Twenty-one people attended including five permitted fishing guides, recreational fishermen, parties interested in public access, and other agency representatives.

On April 29, 1997, a workshop was conducted at the Seedskadee National Wildlife Refuge headquarters to identify potential alternative components for consideration in preparation of a Comprehensive Conservation Plan for the Refuge. On April 30, 1997, a follow-up meeting was held with Service and Consulting Team personnel.

Invitations to participate in the workshop were sent to selected resource specialists with Federal and State agencies involved or interested in resource management within or adjacent to the Refuge. The list included personnel from Fish and Wildlife Service, the Bureau of Reclamation, the U.S. Geological Survey, the Bureau of Land Management, and the Wyoming Game and Fish Department. Those who accepted the invitation to participate were provided a notebook prior to the meeting containing the meeting's purpose, a meeting agenda, background on the planning process including the Fish and Wildlife Service's planning context, and issues identified during scoping.

The purpose of the meeting was to understand identified planning and NEPA issues, discuss draft CCP goals developed by the Refuge, and explore various alternative components that could achieve the goals and address identified issues.

Based on discussions in the workshop and subsequent discussion with Seedskadee NWR staff, the issues considered significant for the EA were identified by Refuge staff for analysis. Based on the issues, the Seedskadee NWR staff developed alternatives to address the issues and the goals. The issues, as they were identified during the scoping process, are described in Chapter 2.

Planning Participants

All individuals that provided comments, oral or written, are listed below. Column 2 identifies the forum in which the commentors participated or submitted comments. The forum in which the commentors participated are identified in column 2 in the following manner:

1. Project Initiation Meeting (SNWR1)
2. Planning Group Meeting (SNWR2)
3. Alternatives Development Workshop (ALT)
4. Commercial Use/Access Meeting (CU)
5. Comment Form (C)

Name	Comment Reference[1]
Rob Keith, Green River, WY	CU
Bennie C. Johnson, Green River, WY	CU, C
Dennis Watts, Green River, WY	CU
Les Skinner, Green River, WY	CU
Van Beacham, Kemmerer, WY	CU, C
Ken Reed, Rock Springs, WY	CU
Patrick Nichols, Rock Springs, WY	CU
George Stonebreaker	CU
Katie Legerski, Rock Springs, WY	CU
Patti Smith, Rock Springs, WY	CU
Duane Kerr, Green River, WY	CU
Scott Talbott, Green River, WY	CU
Jim Pasboy, Superior, WY	CU
Jim Williams, Manilla, UT	CU
Terry Dockter, Green River, WY	CU
Carl Williams, Green River, WY	CU
Beverly Williams, Green River, WY	CU
Ron Remmick, Regional Fishery Supervisor, Game and Fish Department Green River, WY	CU, ALT
Tom Brannan, Rock Springs, WY	CU
Glen Sadler, Green River, WY	CU
Patricia Sadler, Green River, WY	CU
Bill Birmingham, Green River, WY	CU
Bureau of Land Management, Rock Springs, WY	C
Thoman Ranch, Kemmerer, WY	C
M.K. Tucker, Rock Springs, WY	C
Bruce Woodward, Rock Springs, WY	C
John Roberts, Kemmerer, WY	C
Lucy Diggins, Green River, WY	C, ALT
Tim Habenbenger, Wyoming Outfitters & Guides Assoc., Alpine, WY	C
Mitch Nielson, Green River W	C
Dave Vesterby, BLM, Pinedale WY	C, ALT
Howard Hart, Green River, WY	C
Matt and Liz David, Pinedale, WY	C
Darrell Welch, Reclamation, Denver, CO	SNWR1, ALT, C, SNWR2
William Long, Jackson, WY	C
Gary Harvey, Evanston, WY	C
Ken Reed, City of Rock Springs, Family Recreation Center Rock Springs, WY	C
Barry Floyd, Casper, WY	C
Marci Fagnant, Kemmerer, WY	C
Barney Shrank, Lakewood CO	C
illegible	C
Carl T. Williams, Green River WY	C
Greg Auble, USGS Biological Resources Division, Midcontinent Ecological Science Ctr	ALT
Ty Berry, Refuge Supervisor, MT/WY, USFWS	ALT
Renee Dana, BLM, Rock Springs District	ALT
Jaymee Fojtik, USFWS	ALT
Mark Hatchel, BLM, Kemmerer Resource Area	ALT
Sally Haverly, BLM, Green River Resource Area	ALT
John Henderson, BLM, Rock Springs District	ALT
Patricia Hamilton, BLM, Green River Res. Area	ALT
Robb Keith, Wyoming Game and Fish Dept	ALT
Duane Kerr, Wyoming Game and Fish Dept	ALT
Rhoda Lewis, Regional Archaeologist, USFWS	ALT
Mike Misehledey, BLM	ALT
Mike L. Scott, Midcontinent Ecological Science Ctr, USGS	ALT
Al Simpson, Provo Area Office, Reclamation	ALT
Dave Skates, Project Leader, USFWS	ALT
Kevin Spence, Wyoming Game and Fish Dept	ALT
Andy Tenney, ORP, BLM, Rock Springs District	ALT
Anne Marie LaRosa, Seedskadee NWR Former Manager	SNWR1, ALT, SNWR2
Tom Koerner, Seedskadee NWR Former Deputy Manager	SNWR1, ALT, SNWR2
Adam Halverson, Seedskadee NWR	SNWR1, ALT, SNWR2
Suzanne Beauchaine, Seedskadee NWR	SNWR1, ALT, SNWR2
Carol Taylor, USFWS	SNWR1, ALT, SNWR2
Shannon Heath, USFWS	SNWR1, ALT, SNWR2
Dennis Earhart, Bear West	SNWR1, ALT, SNWR2
Emilie Charles, Bear West	SNWR1, ALT, SNWR2
Jan Striefel, Landmark Design	SNWR1

[1] Project Initiation meeting 2/19-20/97(SNWR1)
Planning Group Meeting, 9/18-19/97 (SNWR2)
Alternatives Development Workshop 4/29/97 (ALT)
SNWR1 Commercial Use/Access Meeting 1/9/97 (CU)
Comment Form (C)

The following list of planning and environmental assessment issues was derived from the comments generated during the public process, from interested jurisdictions, and from the Seedskadee NWR staff.

2.2 Planning Issues

Issues, concerns, and opportunities were identified through discussions with planning team members and key contacts and through the public scoping process. Comments were received orally at the meetings, via e-mail, and in writing, both before and during the scoping process. The following issues, concerns, and comments are a compilation and summary of those expressed by the public, other Federal and State agencies, local and county governments, private organizations and individuals, and environmental groups.

2.2.1 Wildlife and Habitat Management Issues

2.2.1.1 Threatened and Endangered Wildlife and Plants

What measures are taken to protect threatened, endangered, and candidate species and species of management concern?

There are concerns regarding conflicts between human use, wildlife use, and sensitive vegetation at the Refuge. Minimizing disturbance of wildlife, especially during nesting, wintering, or other sensitive seasons, is an issue.

2.2.1.2 Riparian Habitats

How will riparian habitat losses be mitigated to support migratory birds and native wildlife species?

The hydrology and morphology of the Green River through Seedskadee NWR have been altered by the construction and operation of Fontenelle Dam. Changes in channel morphology, such as downcutting, have occurred and overbank flooding is rare to nonexistent. Water temperatures have decreased and river flows have been significantly altered from their historical levels and patterns. Cottonwood gallery forests are not regenerating under the current water management regime. Riparian forest communities are losing their structural diversity and becoming single storied. Existing stands of cottonwoods and willows show evidence of severe drought stress and are heavily browsed by native ungulates and some trespass livestock. Existing stands of trees are also susceptible to wildlife, particularly in drought years. A major loss of these forests could occur on the Refuge in 20 to 50 years if nothing is done. Cottonwood forests provide very important habitat for migratory birds.

2.2.1.3 Wetlands

How will wetland losses be mitigated to support migratory birds and native wildlife species? How will wetlands be managed to support migratory birds and native wildlife species?

The Refuge was established as a means to mitigate for loss of wildlife habitat from dam and reservoir construction within the upper Colorado River System. The Fish and Wildlife Service is concerned about impacts to wetland habitat because of their importance to migratory birds and native wildlife species. The extent to which wetland creation or enhancement ought to occur to achieve mitigation, and the types and management of wetlands that should be pursued to support the mix of migratory birds and native wildlife species are issues.

2.2.1.4 Upland Habitats

How would upland shrub and grassland habitat be managed to support native wildlife species and migrating birds?

Upland areas within the Refuge, including the Dry Creek Unit, have not been managed with the intensity of the River corridor. A mosaic of successional stages is desirable from a wildlife habitat standpoint. Opportunities may exist to use a variety of management tools to alter the successional state of upland shrub habitats and provide more habitat diversity.

2.2.1.5 Riverine Habitats

How are fisheries managed on the Refuge?

The public is concerned about future management of the fishery. One concern is that the Refuge installed water diversions and other structures in the River, and their potential affect on fish and resources.

2.2.1.6 Weeds

To what extent are weeds (invasive, nonnative plants) controlled?

Noxious weeds, such as pepperweed, salt cedar, Canada thistle, Russian knapweed, cheatgrasss, and musk thistle are invading most Refuge habitats and dominating the vegetation in some areas. Control methods for some weed species are unknown or not completely effective. Former land management practices and current active management activities have created many opportunities for weeds to become established. How to manage the Refuge to control the spread of weeds and reclaim weed-dominated habitats are issues.

2.2.1.7 Predators and Nuisance Species

How are predators and nuisance species controlled?

Controlled trapping of nest predators occurs during the waterfowl nesting season. Beaver are removed when significant tree losses occur. There is concern about how, and to what extent, predators and nuisance species should be controlled.

2.2.1.8 Fire Management

How is fire managed on the Refuge?

Wildfires are contained and extinguished on the Refuge. Using controlled fires in certain habitats as a management tool is a concern. How much prescribed burning is required to manage certain habitats is also a concern.

2.2.2 Public Use and Recreation Issues

2.2.2.1 Access Management

How is access/travel managed on the Refuge?

The Refuge needs to seek a balance of access for wildlife-dependent recreation while providing adequate protection for wildlife. Off-road vehicle use is prohibited within the boundary of the Refuge; however, unauthorized off-road vehicle use persists. New two-track roads are being created continuously. Significant habitat degradation and wildlife disturbance is occurring throughout the Refuge. In addition, other designated Refuge roads create high levels of wildlife disturbance, particularly during sensitive seasons, such as nesting and wintering. Determining how travel should be managed on the Refuge is an issue. Additionally, the public is interested in the development of walking trails. Some mountain bike use is occurring. Improved access on designated roads, trail development, location, management, and use are concerns.

2.2.2.2 Universal Access

To what extent is universal access to public use facilities and activities provided?

There is a desire to provide special activities/facilities for people with disabilities.

2.2.2.3 Wildlife Viewing and Photography

To what extent are opportunities provided for wildlife viewing and photography?

Wildlife observation and photography are priority wildlife-dependent recreational activities. There is interest in developing or enhancing opportunities for visitors to better view wildlife and wildlife habitats. Proposals include photography and viewing overlooks/sites; auto tour routes; and walking/hiking trails.

2.2.2.4 Hunting

What types of hunting opportunities are provided on the Refuge?

Hunting is a priority wildlife-dependent public use on refuges. There are different points of view on whether or not hunting should be allowed on the Refuge. How will areas "closed to hunting" be managed to provide adequate sanctuary for wildlife species? There are concerns about what species should be hunted and what are the Refuge's goals and objectives with respect to management of game species. There is some interest in the Refuge providing duck hunting blinds.

2.2.2.5 Recreational Trapping

What types of recreational trapping are allowed on the Refuge?

A question arose about whether trapping should be used for predator control and if this could be accomplished through recreational trapping.

2.2.2.6 River Access

How is River access managed?

Where and how should public River access, parking, and boat launch ramps and associated public use facilities be provided are issues.

2.2.2.7 Sport Fishing

What types of sport fishing opportunities are provided on the Refuge?

The Refuge's fishery is popular for bank and float fishing including both commercially guided and recreational fishing. There are conflicting points of view among anglers and fishing guides about how fishing is regulated.

2.2.2.8 Commercial Guide Fishing

Is commercially guided fishing allowed and how is it managed?

There are concerns about what level of commercial and recreational fishing on the Green River is appropriate in order to avoid negative affects on wildlife. If Seedskadee NWR staff continues to allow commercial guide fishing, issuance of Special Use Permits should be based upon the desirable level of River use.

2.2.2.9 Camping

Is camping allowed and, if so, where and how are sites developed and the use managed?

Camping is not considered wildlife-dependent recreation. However, at Seedskadee NWR, there is demand for camping opportunities, especially from people floating the 35 miles of River through the Refuge. Campgrounds are located upstream from the Refuge at Fontenelle and primitive upland camping occurs downstream from the Refuge on Rock Springs Grazing Association lands and on adjacent BLM land. There are questions about whether or not camping is a compatible use and should be permitted.

2.2.2.10 Boating

What types of boating are allowed on the Green River through the Refuge?

There are concerns that use of motorized watercraft on the Green River may impact wildlife and the area's solitude.

2.2.2.11 Visitor Use Level

What is the appropriate visitor use level of the Refuge?

How are visitor use levels determined within the Refuge? There is question about the extent of impact from public use, including recreation and interpretive programs. Any determinations of visitor use levels are complicated by the need to minimize wildlife disturbance, to avoid encroachment on solitude, and by the nature and capacity of visitor facilities, parking, and amenities.

2.2.2.12 Environmental Education

What type of environmental education programing is provided to the public?

The Refuge staff provides educational opportunities on an "as needed" basis. There are opportunities to partner with other agencies to provide an environmental education program and facilities that promote an awareness of the basic ecological foundation for the interrelationship between human activities and the natural system.

2.2.2.13 Environmental Interpretation

To what extent are opportunities pursued to interpret natural resources, especially wildlife and their habitat for the visiting public?

Interpretive signs at the Refuge are limited to the kiosks and the auto tour. Those that exist on the Refuge are outdated. Determining opportunities and locations for interpretation for wildlife, habitat, and cultural resources are issues.

2.2.2.14 Public Information

How is information on the Refuge, its resources, and regulations provided to the public and what are the effects of public use, including recreation and interpretive programs, on Refuge resources?

There are general concerns about better communication with the public, neighbors, local jurisdictions, and other agencies on the purpose and mission of the Refuge—why it and its management policies are important, both locally and to the broader ecosystem.

2.2.2.15 Cultural Resources

How are cultural resources protected? To what extent are opportunities pursued to interpret cultural resources for the visiting public?

Potential impacts to cultural resources from facilities development, habitat manipulation, visitor use, and Refuge operations and maintenance are concerns. There is also an interest in developing more interpretive opportunities of cultural resources such as locating interpretive displays at sites/cabins and public points of interest.

2.2.2.16 Partnerships

To what extent are partnership opportunities pursued with volunteers, local service groups, organizations, individuals, schools, and other governmental agencies?

Determining opportunities for Refuge management to "partner" with local groups, organizations, individuals, schools, local and State governments, and other agencies to achieve the Refuge's mission and goals and to conserve and enhance wildlife in the Green River ecosystem is an issue. Likewise, finding opportunities to encourage and utilize volunteers is an interest.

2.2.3 Administrative Management Issues

2.2.3.1 Land Acquisition

Is further land acquisition or land disposal planned?

Land acquisition within the Refuge boundary is essentially complete. Two 2.5-acre parcels remain to be acquired should there be willing sellers. A proposal was set forth several years ago to transfer land along the Big Sandy River from Reclamation to the Service to be managed as part of the Seedskadee NWR. There are questions about whether there is an interest in exchanging, acquiring, or disposing of lands within or adjacent to the Refuge boundary.

2.2.3.2 Minerals

How will privately-owned minerals be developed?

Development of minerals on or immediately adjacent to the Refuge may impact wildlife, wildlife habitats, and the quality of the visitor experience. There is a question about whether seismic activity should be allowed and, if so, under what circumstances. Protecting the wildlife resources from unacceptable impacts is a concern.

2.2.3.3 Right-of-Way

What is the Service's policy toward requests for grants of right-of-way across the Refuge?

There is a question about how Refuge staff responds to right-of-way requests.

2.2.3.4 Livestock Access

How is access to water for livestock provided?

The Refuge has traditionally provided access to the River for watering livestock from adjacent private/public land allotments. Water access lanes to the River are difficult to secure; for example, preventing trespass from livestock. How can the Refuge provide livestock access to water while maintaining the integrity of the Refuge boundary and preventing trespass?

2.2.3.5 Grazing

Is grazing allowed on the Refuge? What is Refuge management doing to prevent livestock trespass?

The Refuge has been fenced to prevent livestock from entering, thus improving and protecting habitat for wildlife. Grazing may be an appropriate tool to manage some of the Refuge's habitats. Construction of new fences, maintenance of existing or new fences, and the removal of old fence and wire are concerns.

III. Refuge and Resource Descriptions

3.1 Geographic / Ecosystem Setting

Seedskadee NWR is 26,382 acres in size and located in southwestern Wyoming along the Green River (Map 1). The entire Refuge is within Sweetwater County in the heart of the Green River Basin. Geographically, the Refuge is long and narrow and bisected throughout its length by the Green River. Biogeographers have divided North America into provinces; natural regions that share similar climate, soils, topography, and vegetation. The Refuge is within the *Wyoming Basin* province—a high elevation Great Basin shrub dominated habitat.

The Service has adopted an ecosystem approach to national natural resource management and has identified 52 ecosystems within the United States. Within the U.S. Fish and Wildlife Service's ecosystem organization, the Refuge lies within the Upper Colorado River Ecosystem (Map 2). The Upper Colorado River Ecosystem incorporates the watersheds, headwaters, tributaries (including the Green River), and mainstem of the Colorado River in Wyoming, Utah, and Colorado. Browns Park National Wildlife Refuge in northwestern Colorado and Ouray National Wildlife Refuge in northeastern Utah are two other national wildlife refuges in the ecosystem. The three refuges share many similarities. All are located along the Green River, the primary tributary to the Colorado River system and have significant amounts of marsh and riparian habitat. Together, the three refuges form a valuable complex of wildlife habitat.

The proposed management priority issues and goals for the Upper Colorado River Ecosystem focus on national trust resources (endangered species, migratory birds, and wetlands). Further, recreation is recognized as a high priority where conflicts with native species and their habitats do not occur. The following are the priority resource issues and goals for the Upper Colorado River Ecosystem.

Priority Resource Issue: Decline of native aquatic communities due to construction of dams and reservoirs; and . . . recovery of native aquatics while recognizing competing demand for recreational use of nonnative sport fishing.

> Goal: Restore and maintain an aquatic system capable of supporting the diversity of native aquatic communities to achieve recovery of listed and candidate species and prevent the need for future listings.

Priority Resource Issue: The quality and quantity of native wetland and riparian habitats continue to decline via floodplain development, intensive land use, and impoundments of water courses throughout the Upper Colorado River Ecosystem. Changes in flow regimes and channel manipulation result in significant management issues for continued health.

> Goal: Reverse the trend; restore, maintain, and enhance the species composition, areal extent, and spatial distribution of wetland and riparian habitats.

Priority Resource Issue: Terrestrial biological diversity within the Upper Colorado River Ecosystem has declined due to the degradation of terrestrial habitats. Range and forest land management practices, both public and private, have resulted in the fragmentation, degradation, and loss of terrestrial habitats.

> Goal: Promote terrestrial biological diversity and ecosystem stability through sound land management practices thereby avoiding fragmentation, degradation and loss of terrestrial habitats.

3.1.1 Climate

The Refuge's climate is characterized by long, cold winters and short, warm summers with a growing season of about 90 days. Temperatures typically range from minus 30 degrees Fahrenheit to 90 degrees Fahrenheit with frost penetration to 50 inches. Most precipitation falls during spring and early summer. December and January are the driest months. Winds are predominately from the west-northwest and average 8 to 10 mph. Average annual precipitation is 6.48 inches.

3.1.2 Geological Resources

Beds of limestone, sandstone, and shale, ranging in age from Upper or Middle Cambrian to Upper Cretaceous, underlie the area. Overlying this are gently warped Tertiary sediments averaging several thousand feet in depth and extending up onto the flanks of the surrounding mountains from which they were derived. Upper Green River Basin formations contain rich deposits of coal, oil, natural gas, and soda ash (trona).

3.1.3 Soil Resources

The soils located within the Seedskadee NWR are described in the BLM Green River Resource Area Resource Management Plan (1992) to include the following four soil units:

II Cambarge, Pepal, Huguston, Leckman soils (northern and western portion of the Refuge)

Deep, well drained, gravely sandy loam and fine sandy loam soils formed on nearly level or sloping stream terraces and alluvial fans. Elevations are from 6,200 to 6,500 feet. Precipitation ranges from 7 to 9 inches per year.

II Teagulf, Huguston, Haterton, Wint, Tasselman, Seedskadee, Leckman, Kandaly soils (eastern portion of the Refuge)

These soils are moderately deep to very shallow, well drained soils formed on rolling upland plains dissected by rock ravines, short escarpments, and draws. Elevations are from 6,100 to 6,700 feet. Precipitation ranges from 7 to 9 inches per year.

II Kandaly, Westvaco, Haterton, Teagulf, Huguston soils (eastern portion of the Refuge)

Deep sand dunes intermingled with moderately deep to very shallow, well drained, strongly alkaline soils formed on rolling upland plains and fans. Included in this unit are some areas of badlands. Elevations are from 6,300 to 7,000 feet. Precipitation ranges from 7 to 9 inches per year.

II Dines, Quealman, Chrisman soils (mid- to southern-portion of the Refuge, bottomlands)

Deep, poorly to well-drained soils formed on nearly level or sloping floodplains, bottomlands, and alluvial fans. Some soils in this unit are strongly saline and/or alkaline. Elevations are from 6,000 to 6,600 feet. Precipitation ranges from 7 to 9 inches per year.

Seedskadee NWR's sandy soils (Kandaly, Westvaco, Huguston) are very susceptible to wind erosion when the protective vegetative cover has been removed. Soluble salt levels in some soils affect management potentials due to toxicity, reduced infiltration rates, limits on nutrient availability, and reduction of water available to plants. Major causes of increased salinity contribution from public lands are irrigation, overgrazing, off-road vehicles, and energy exploration and extraction. These activities cause some compaction of the soil surface, with a reduction of plant cover, which in turn leads to increased runoff carrying salt laden sediments into drainages. Within the region, moderately saline soils can be found along major drainages such as the Green River, Big Sandy River, Bitter Creek, and Blacks Fork River. Soils especially susceptible to surface disturbing activities include unstable soils, sandy soils and erosive soils.

3.1.4 The Seedskadee Project and Mitigation - Early Proposals

Based upon Bureau of Reclamation feasibility studies completed in 1950, the Seedskadee Project was authorized for construction as one of the series of projects included in the 1956 Colorado River Storage Project Act. The original primary purposes of the Seedskadee Project were: 1) diversion of water from the Green River and delivery of irrigation water to 60,720 acres of previously undeveloped desert lands, and 2) development of a wildlife refuge as mitigation for losses of fish and wildlife habitat. The lands proposed for irrigation were to parallel the Green River on both sides and include 51,690 acres of family farm units and 9,030 acres of community pasture. The Refuge was to be located along the Green River surrounded by irrigated community pasture and privately-owned and operated farmlands.

Project feasibility studies continued after project authorization. By Act of Congress in 1958, authorization was provided for withdrawals of public lands and acquisition of privately-owned lands to achieve project purposes, namely, project works and canals, lands for agricultural use, and lands for mitigation developments. By 1959, it was determined that a dam and storage reservoir (Fontenelle), as opposed to the originally proposed diversion structure, would be necessary to regulate Green River flows and to deliver water to farm units, community pastures, and the Seedskadee NWR. The 1959 Definite Plan proposed an 18,000-acre refuge with water supplies from return irrigation flows, direct Green River flows, and storage releases from Fontenelle Reservoir.

By the mid-1960s, approximately 193,850 acres had been withdrawn or acquired by Reclamation for project purposes. Prior to dam and reservoir construction, the 1959 Definite Plan was modified to include a larger dam and reservoir to provide municipal and industrial water storage. The dam was completed in April 1964, creating a 20-mile-long reservoir upstream from Seedskadee NWR and with a total storage capacity of 345,000 acre-feet that at full pool, inundates almost 13 square miles. However, even prior to completion of the dam, the economic feasibility of the original Seedskadee Project concept began to unravel. A stop-order was issued by Reclamation in May 1962 to suspend construction of delivery canals and irrigation features until economic viability of the proposed high altitude farm units could be reasonably demonstrated.

In 1972, a revised Definite Plan for the Seedskadee Project was prepared that significantly scaled back and phased in the acreage which might be made available for irrigable farmland; increased commitments for downstream industrial and municipal water; planned a 34,000 acre-feet annual water supply for the Seedskadee National Wildlife Refuge; and continued to provide flood control and power generation purposes. The 1972 Reclamation Plan reported that $430,000 had been spent-to-date on acquisition of Refuge lands and Refuge planning and construction.

Eventually, it was determined that irrigated farm units and community pastures, the original driving motivation for development of the Seedskadee Project, were not economically viable at this location and altitude, and that there could be conflicts between development of irrigated farmlands and the successful extraction of underlying and adjacent Green River Basin trona deposits. The development of the farm units and the farm irrigation water delivery systems was abandoned. Although the key element in the Seedskadee Project was never realized, the motivation and interest in successful mitigation for habitat loss continued.

3.1.5 Fontenelle Dam and Reservoir and River Hydrology

Today, Reclamation's Fontenelle Dam and Reservoir purposes include water storage and regulation of the flows of the Green River for:

1) power generation,
2) municipal and industrial use,
3) fish and wildlife, and
4) recreation.

Fontenelle Dam is an earthen filled structure with a crest of 4,820 feet and a height of 116 feet above riverbed. Fontenelle Reservoir has a total storage capacity of 345,000 acre-feet. A power plant is located adjacent to the toe of the dam consisting of a 12 megawatt generator and one 16,000-horsepower hydraulic turbine. Although it is not a specified purpose of the facility, the reservoir provides incidental flood control on the Green River from the dam downstream to Flaming Gorge Reservoir.

Recreation facilities have been developed at Fontenelle by Reclamation including picnic areas, campgrounds, and boat launch facilities. Three Reclamation developed campgrounds (Tailrace, Weeping Rock, and Slate Creek) are located on the Green River below Fontenelle Dam and just upstream from Seedskadee NWR. These recreation facilities are now managed by the Bureau of Land Management.

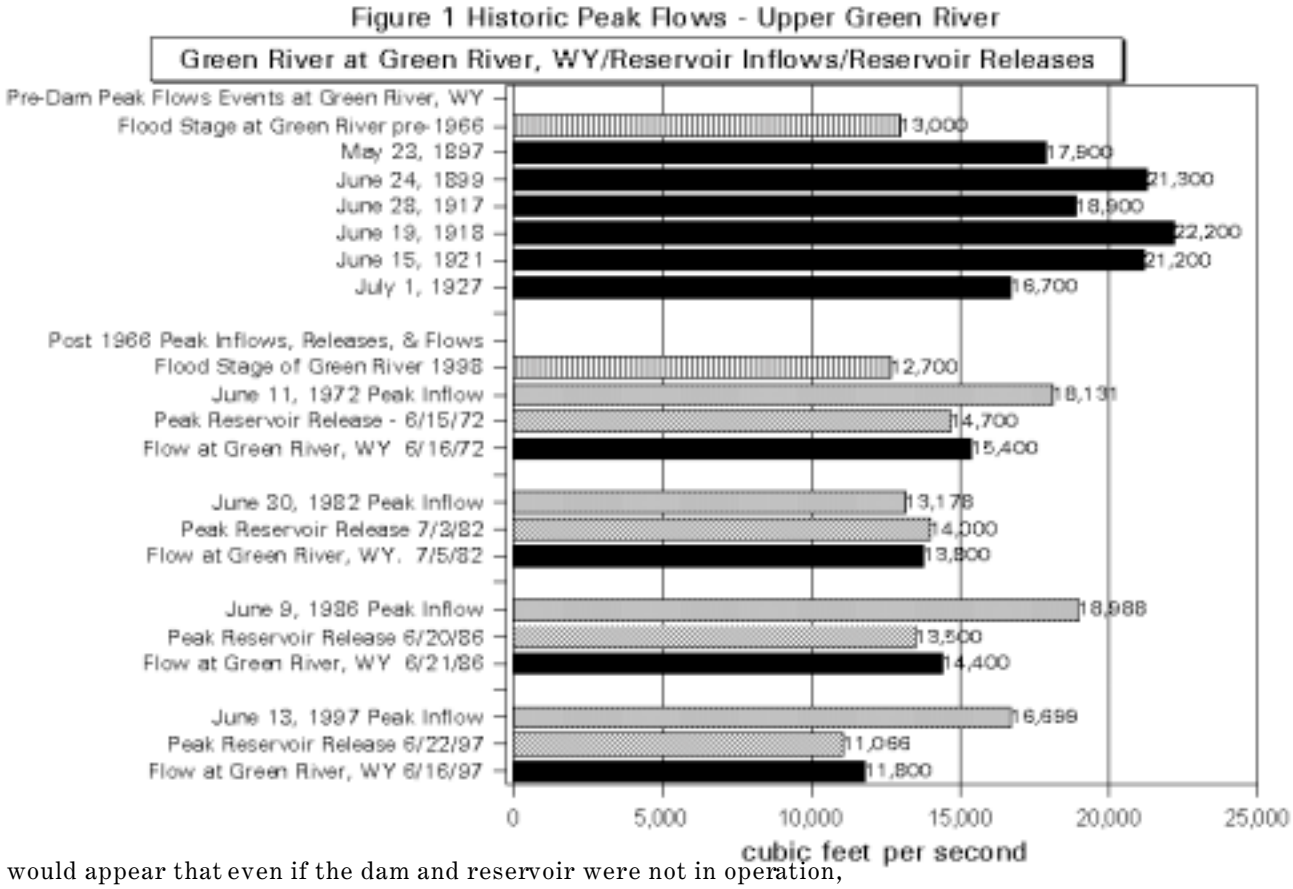
Operation of the dam and reservoir has moderated the historical downstream flows of the Green River. A number of factors guide operation of the reservoir and downstream releases. Among these are providing a marketable water yield from the reservoir to satisfy water commitments, providing minimum downstream flows for maintenance of the fishery and waterfowl habitat (a minimum flow of 300 cfs), power production, and dam safety.

Fontenelle Reservoir's storage capacity is small in relation to the inflows from the Upper Green River Basin (Ryan, 1998). Because the storage capacity is small compared to the inflow volume, there is limited operational flexibility available. In order to accommodate spring inflows, reservoir levels are dropped through the winter and early spring down to its minimum pool, 93,000 acre-feet, by April 1. This provides a runoff storage capacity of 252,000 acre-feet.

Flood control was not an original purpose of Fontenelle Dam and Reservoir. Outside of the City of Green River and its environs, few structures exist within the floodplain between Fontenelle Dam and Flaming Gorge Reservoir. The official flood stage at Green River, Wyoming is now set at 15,000 cfs; however, the National Weather Service would issue flood warnings to the City of Green River at 12,700 cfs (Ryan, 1998).

Because storage capacity is limited in relation to the river's flow volume, releases mimic natural river flow patterns but greatly moderate the highs and lows. These circumstances result in changes of the River hydrology downstream from the dam. Figure 1 displays some examples of changes in peak flow events. Historical flood event data (USDI, BOR 1959), showed periods of flows at the City of Green River exceeded 13,000 cfs between 1897 and 1921. These high flow events were of varying magnitude and duration (from two days in 1927 to nearly a month in 1899) and were of irregular frequency, but were substantially higher flows than those experienced at the City of Green River since 1966.

Figure 1 also displays flow data since 1966 and operation of the reservoir. Since 1966, there have been five flow events in which inflows into Fontenelle Reservoir have exceeded 13,000 cfs. The chart displays four of the five major flow events including the date and volume of peak reservoir inflow, the date and peak reservoir release, and the date and volume at the City of Green River for each event. An initial observation for these four events is that not only is the flow at the City of Green River substantially less than the historical peak flow events at the top of the chart, but the inflows into the reservoir are also less than three of the historical high flows at the City of Green River.



It would appear that even if the dam and reservoir were not in operation, flood events greater than 20,000 cfs, like those experienced in 1899, 1918, and 1921 would not have occurred on the Green River through Seedskadee and the City of Green River since 1966. However, the chart also displays that the peak flow volumes that were experienced on the Upper Green River since 1966 were substantially moderated with operation of the dam.

In three of the four peak flow events since 1966, peak flows below the dam and through the Refuge were substantially lower than the peak flows entering the reservoir. Note that for 1972, 1986, and 1997, flows at the City of Green River exceed the flow release from the reservoir reflecting downstream contributions from tributaries, notably the Big Sandy River.

In addition to moderating the peaks of high flows below the dam, reservoir operations have stabilized and raised winter low flows below the dam. Winter flows are maintained at higher than reservoir inflow rates to realize fishery and hydropower production benefits. Table 3.1 displays the range and average of inflows for December through February for each of the past four winters as well as the range and average of reservoir releases for the same time periods. Winter release rates are calculated to gradually and evenly drain the reservoir back down to its 93,000 acre-foot minimum pool by April 1 so that it has capacity to receive and store spring runoff. By gradually releasing the remaining storage pool, minimum flows and power production can be maintained throughout the winter season.

Table 3.1 Winter Flows in cfs Above and Below Fontenelle Reservoir

December, January and February	High Inflow	Low Inflow	Average Inflow	High Release	Low Release	Average Release
Winter 1994-1995	674	224	423.2	894	796	841.1
Winter 1995-1996	891	227	508.3	1332	1134	1,253.8
Winter 1996-1997	810	308	638.7	1321	1106	1,208.4
Winter 1997-1998	902	447	626.6	1469	1326	1,411.1

The relationship between inflows and releases at Fontenelle on the Green River are graphically depicted on consolidated hydrographs in Appendix H and provide a visual depiction and summary of the above discussions. The operation of Fontenelle Dam and Reservoir moderates flows of the Green River below the dam from what would be experienced if the dam were not in place. The high peaks of major high flow events are substantially reduced below the dam. The time between high peak inflows and high peak releases into the River below the dam is usually only a few days. Winter flow releases are fairly stable and substantially exceed inflows.

3.1.6 Area Socio-Economics

Prior to the mid-1800s, the region was populated by native Americans and occasional explorers, fur trappers, and traders. For several years, fur trappers and traders would travel long distances to annually swap goods, tales, and furs at rendezvous along the Green River. Starting with the 19th Century migration of settlers to the west coast and Utah, remote trading outposts and military posts were established, marking the first modern permanent settlement in the region. Hundreds of thousands of people and their livestock passed through southwestern Wyoming. They traveled the Mormon Trail, the Oregon Trail, the California Trail, and numerous cutoffs and shortcuts, all crossing the Green River and many passing through today's Seedskadee NWR.

The completion of the Union Pacific Railroad in May 1869 developed the first major Wyoming communities: Cheyenne, Laramie, Rawlins, Green River, and Evanston. Rock Springs, Superior, Frontier, Kemmerer, and other towns grew up where coal was successfully mined and used to fuel the rail engines.

Upon statehood, the Federal government retained lands that had not been converted to private ownership and the State of Wyoming was provided from those lands two sections in each township. Thus, by the end of the 19th Century, the landownership patterns were set. Privately-owned lands are primarily lowlands along streams and rivers, town sites, and the Union Pacific land grant. Generally, Wyoming owns two sections per township. But, most lands are Federally-owned being managed by the Bureau of Land Management, the U.S. Forest Service, the U.S. Fish and Wildlife Service, the Bureau of Reclamation, or the National Park Service. Of the 6,773,340 acres in Sweetwater County, 1,828,641 acres are privately-owned, and they are held primarily by the railroad.

Rich natural resources underlie much of the Green River Basin and surrounding lands. Coal, trona, oil, and natural gas have been discovered and extracted in enormous quantities, often through lease of Federally-owned minerals. These mining operations and their processing operations and related coal-fired power plants have provided significant employment and growth opportunities for the region.

The region's economy is a product of history and environment. Principal sources of employment and income are mineral extraction and processing industries, tourism, service industries, government employment, and agricultural—primarily ranching, and transportation. The population density of Wyoming is low at 4.9 persons per square mile. People live in isolated ranches or relatively smaller cities and towns and are accustomed to traveling long distances for work, recreation, and shopping.

3.1.7 Population Growth

In 1950, the populations of the cities closest to Seedskadee NWR were 10,857 (Rock Springs), 3,187 (Green River), and 1,667 (Kemmerer). The 1990 census for these communities were 19,050, 12,711, and 3,020 respectively, establishing a net 121 percent growth. However, based on 2000 census data Rock Springs and Green River populations decreased to 18,708 and 11,805, respectively. Between 1990 and 2000, Sweetwater County's population decreased 3 percent while Lincoln County increased 15 percent. Wyoming's population in 2000 was 493,782 and is projected by the U.S. Bureau of Economic Analysis to grow slowly over the next 10 years.

3.1.8 Income

Per capita personal income for Wyoming in 1993 was $15,415, 24th highest in the nation. However, with a higher percentage of its wage earners working in relatively higher wage paying production and extractive industries, per capita personal income for Sweetwater County in 1994 was $20,666.

3.1.9 Economic Development Trends and Pressures

Employment over the past ten years in Sweetwater County peaked in 1994 at 19,935 jobs. This was up 2,599 jobs from 1989, or a 15 percent increase. By the first six months of 1998, employment in the county had declined to 18,594. In 1998, leading employment sectors were mining (3,668 jobs), retail trade (3,414), local government (3,320), services (2,629), transportation, communication, and public utilities (1,447), manufacturing (1,445), and construction (1,041), with other sectors having fewer than 1,000 workers in each. Retail trade and services are economic sectors which have grown over the past decade and can be expected to continue to grow with tourism, relative stable economies, and growth in leisure time and disposable income. Wyoming economic development efforts often credit the State's natural wonders and National Parks, recreational opportunities, abundance of open space and wildlife, and the absence of personal or corporate State income taxes.

3.1.10 Changes in Demand for Outdoor Recreation

Outdoor recreation continues to grow in popularity with over 70 percent of people 16 and over participating in some form of outdoor recreation. A U.S. Forest Service study (1989) projects significant continuing growth in participation in activities such as day hiking, backpacking, camping, canoeing, kayaking, rafting, cross-country skiing, bicycling, wildlife observation, and photography through the next several decades.

It is estimated that about 70 percent of visitors to Seedskadee NWR live within the region. With continuing higher than average per capita income, projections for statewide and regional population growth, and overall growth in participation in outdoor recreation, visitation to Seedskadee NWR will likely increase over the decades ahead.

3.2 Refuge Resources, Cultural Resources, and Public Uses

3.2.1 Water Rights

Wyoming water law dates back to territorial days and is based on the "doctrine of prior appropriation." Under this doctrine, the first to put the water to beneficial use has the most senior right. When adequate water supplies are available for all users, the issue of senior water rights is minor. This has been the case for the use of water by the Refuge since it was established. As demands increase for the use of water from the Green River and the Colorado River and its tributaries, this will likely become an important issue for the Refuge in the future. Water rights held by the Refuge are summarized in Table 3.2.

Table 3.2 Summary of Water Rights Held by the Refuge

Permit #	Cert. #	Name	Flow, Storage, Use	Priority Date
12202	15164	Hamp No. 1	1.54 cfs	1/9/1914
12203	15165	Hamp No. 2	1.67 cfs	1/9/1914
12203	15166	Hamp No. 2	4.04 cfs	1/9/1914
13463	24399	Rood Ditch	1.00 cfs	4/28/1913
15906	20188	Herman Ditch	0.17 of .99 cfs	12/9/1920
15907	20189	Otterson Ditch	1.18 cfs	12/9/1920
15907	20191	Otterson Ditch	0.19 cfs	12/9/1920
15907	20190	Otterson Ditch	1.35 cfs	12/9/1920
15907	20758	Otterson Ditch	2.27 cfs	12/9/1920
15907	21649	Otterson Ditch	2.65 cfs	12/9/1920
16985	22614	Tallman Ditch	1.30 cfs	6/13/1925
22364		Fontenelle Res	115.00 cfs; FW Use	4/26/1955
22365		Res Outlet, Canals	0.00 cfs	7/9/1962
22368		Fontenelle Res	0.00 cfs; FW Use	7/9/1962
3576E	36028	Superior Enl.	.13 cfs	4/6/1916
4006E	36029	Superior Enl.	1.04 cfs	5/19/1919
5330E	24400	Rood Ditch Enl.	0.14 cfs	4/29/1942
5402-E	26566	Hamp No. 2 Enlarge	0.56 cfs	6/26/1945
6629 RES		Fontenelle Res	5,000 acre-feet storage for FW Use	1/22/1962
U.W. 47679		Headquarters Well No 1	50 gpm; Domestic use	4/23/1979
U.W. 69131		Headquarters Well No 2	30 gpm; Fire Protection Use	12/14/1984

The Refuge staff believes it holds sufficient water rights to implement its goals and objectives based on the following reasons:

1. Irrigation water rights were attached to the agricultural lands acquired for the Refuge and are utilized to restore, enhance, or create wetlands and other habitats.
2. Under Contract No. 14-06-400-6193 with Reclamation, first priority to 5,000 acre-feet of Fontenelle Reservoir storage water is reserved to the United States for use on the Seedskadee NWR.
3. The Refuge is allocated up to 28,000 acre-feet annually, at a rate of 115 cfs, deliverable under Reclamation's Direct Flow Permit for wildlife refuge requirements.

3.2.2 Refuge River Jurisdiction

Navigability and jurisdiction on and under water bodies, including lakes, rivers, and streams, is a complex and confusing issue. Most states, including Wyoming, have chosen to rely on precedents set by court decisions rather than resolve those issues legislatively.

The only body of water in the State of Wyoming that is considered to be navigable by Federal agencies (Corps of Engineers [COE]) is the Flaming Gorge Reservoir to its high water mark. While the Wyoming Constitution declares all natural waters within the State the property of the State, the Supreme Court of Wyoming concluded in a 1961 decision (Platte River Boating Supreme Court Decision) that there are no navigable water bodies in the State. In that same decision, the Wyoming Supreme Court also declared the river bottoms to be the property of the adjacent landowners. In essence, according to the court's interpretation, a person may float on the publicly owned water, but could not anchor that boat nor wade on the river bottom.

Federal Courts have clarified these issues in regards to Federal agencies (i.e. National Parks, National Forests, National Wildlife Refuges) that own and manage lands that encompass portions of water bodies (lakes or rivers). The Federal Courts have consistently maintained that Federal agencies have jurisdiction over recreational uses on these water bodies when the water body is integral to the primary purposes for which the park, refuge, or forest were established.

For example, in the U.S. v. Hells Canyon Guide Service case, the District Court maintained that the Property Clause of the Constitution gave the government power "to regulate conduct on non-federal land {the Snake River that runs through the National Forest} when reasonably necessary to protect adjacent Federal property or navigable waters." In addition, this case stated "Congress' power over Federal lands includes the authority to regulate activities on non-federal waters in order to protect the archaeological, ecological, historical and recreational values on the lands" (United States v. Hells Canyon Guide Service; U.S. District Court of Oregon, Civil No. 79-743; 5-6; 1979).

In the court decision in U.S. v. Brown, the Circuit Court wrote, "... we view the congressional power over Federal lands to include the authority to regulate activities on non-federal public waters in order to protect wildlife and visitors on the lands" (United States v. Brown, 552 F.2d 822; 8th Cir. 1977).

Finally, in the U.S. v. Armstrong case, the Circuit Court upheld a conviction against Armstrong and Brown who were conducting a commercial business without a permit within a National Park. In this case, the Circuit Court relied on a U.S. Supreme Court precedent stating, "In Kleppe v. New Mexico, 426 U.S. 529, 546 (1976), the Supreme Court held that Congress may make those rules regarding non-federal lands as are necessary to accomplish its goals with respect to Federal lands" (United States v. Armstrong; No. 99-1190; 8th Cir. 1999).

The primary purposes of Seedskadee National Wildlife Refuge were established in Section 8 of the Colorado River Storage Act of 1956. Pertinent sections of this act read:

> In connection with the development of the Colorado River storage project . . . , the Secretary [of the Interior] is authorized and directed to investigate, plan, construct, operate, and maintain . . . (2) facilities to mitigate losses of, and improve conditions for, the propagation of fish and wildlife.

There is no question that the Green River played a critical role in the establishment of Seedskadee Refuge and is a necessary component for the Refuge to meet its primary purposes. However, regardless of jurisdiction, the Refuge's first priority is to strive to work with appropriate departments within the State of Wyoming to meet Refuge management goals and objectives.

3.2.3 Reserved Rights and Privately-Owned Mineral Estate

Purchase of many tracts on the Refuge were subject to existing rights-of-way or granted in deeds at the time of purchase. Some of these existing rights-of-way include Sweetwater County Road near Big Island, a 200 foot highway right-of-way to the Wyoming Highway Department along State Highway 28, buried telephone and electric lines along Highway 28, and a high voltage power line through the south end of the Refuge.

Many tracts of land also contain outstanding reserved subsurface minerals. On these lands, oil and gas leasing is limited to those areas on which drainage is occurring from adjacent public land leases. Currently, there are active oil and gas leases on 2,390.4 ac of the Refuge although none are currently under development. According to the 1997 BLM Green River Resource Management Plan, there is an "oil shale withdrawal" extending over the entire Refuge, Farson, and Green River area to protect wildlife values of this area. However, the BLM lands surrounding the Refuge are completely leased for oil and gas (BLM Green River RMP, 1997). Minerals are privately owned on about 15,000 acres purchased from private parties and the State of Wyoming by Reclamation.

Because there are proven economic reserves of oil, gas, trona, and aggregates within and near the Refuge, the Refuge is experiencing, and will continue to experience, direct and indirect impacts from mineral exploration and developmental activities. Regulation of mineral activities can be grouped into one of three categories.

Locatables (Hardrock): Regulations for mining on refuges and the Mining Act of 1872, as amended, are contained within the Code of Federal Regulations at 43 CFR 3500 and 3800, and 50 CFR 27. On Seedskadee NWR, where valid existing mineral rights are outstanding, the exercise of such rights will be permitted by a special use permit issued by the project leader. The permit does not affect the vested right of the mining claimant to reasonable access to the claim for prospecting and mining. The presence of locatable (hardrock) minerals within the Refuge is unknown.

Leasables: This category includes those minerals that are disposable only by leases issued under the authority of the Mineral Leasing Act of 1920 as amended. By Federal regulations, the Secretary of Interior has determined not to issue leases on lands within the contiguous 48 states that are in the Refuge System except where it is determined by the Service and BLM that a lease should be issued to prevent the loss of oil or gas underlying the Refuge by drainage or that the lands are needed for unitization and/or spacing requirements (43 CFR 3103.5). Although leases are issued by the BLM, they are subject to conditions recommended by the Service for reasonable access and the protection of Refuge resources.

Salables: Salables are common variety materials, which may be sold, or given away to other governmental units and nonprofit organizations, at the discretion of the Service, and with stipulations to protect refuge resources (Mineral Materials Act of 1947, 43 CFR 3600, and 50 CFR 29). Salable minerals within the authorized Refuge boundary potentially include sand, gravel, crushed stone, and rock. There is one abandoned gravel pit along the Green River in the southern portion of the Refuge.

The Fish and Wildlife Service Manual (612 FW1) goes into detail on the Service's responsibility in exploration and production activities, processing permit applications, and protecting wildlife and refuge resources. Basically, the Service has three distinct roles involving mineral activities on refuge lands:

1. Management of surface use operations to minimize adverse environmental consequences and to ensure proper reclamation of disturbed lands.
2. Validation of mining claims (the BLM administers United States mining laws).
3. Reviewing right-of-way applications for ancillary activities such as pipelines and railroad spurs crossing refuge lands.

The Bureau of Land Management is responsible for granting a right-of-way for off-lease facilities, and intra-service coordination on right-of-way applications is the responsibility of the service's Division of Ecological Services. The Service policy on rights-of-way is not oriented toward analyzing cost-effectiveness or social impacts, but to minimize impacts on wildlife.

Rights were reserved to water and roundup livestock according to Warranty Deeds with the Rock Springs Grazing Association and Crosson Ranches Inc. Specific rights are outlined in each Warranty Deed which are located in Refuge files. The construction of 17 water access lanes has fulfilled most livestock watering requirements. Crosson Ranches has access to specific Refuge lands for the purposes of calving and rounding up cattle. Other rights involve access to various ditches and headgates for the maintenance of irrigation systems.

Adjacent Land Use: Nearly all adjacent lands are federally-owned and managed by either the BLM or Reclamation. Use of these lands primarily consists of grazing by livestock (cattle, sheep, horses), extraction of oil and gas, and outdoor recreation. Several private ranches exist near the Refuge. Rock Springs Grazing Association also owns large tracts of land, primarily adjacent to the southern half of the Refuge and south of the Refuge. They also hold cooperative grazing leases with the BLM along much of this area.

Mining is the other principal economic use of the adjacent lands. Southwestern Wyoming produces approximately 90 percent of the world's soda ash. One trona mine is located immediately downstream of the south border. There is also a large natural gas processing plant near the north end of the Refuge (Shute Creek -Exxon plant).

3.2.4 Refuge Vegetation and Wildlife Habitats

Seedskadee NWR is located on what is classified as a high desert plain. Native upland plant associations include sagebrush/grass, greasewood and shadscale. Bottomland plant associations include wet meadow riparian types with willows and cottonwoods dominating the overstory (Map 3).

Various agencies and consultants have worked with the Refuge staff in conducting past and current studies on vegetation and habitat at Seedskadee NWR. Because the studies have been done for different purposes, they have not been consistent in their classifications of habitat types or vegetative communities. Information from these studies has been utilized in this section and in the preparation of vegetation maps. For vegetation community components and descriptions, the text primarily relies upon Seedskadee National Wildlife Refuge Wildlife-Habitat Matrix and Species Accounts, prepared for the Refuge by Pioneer Environmental Services, December 22, 1997. A copy of the report is available for review at the Refuge.

While the broad habitat types may be consistent, there are variations in subgroupings. Therefore, in the discussions of the various groups and communities, the corresponding groups or classifications as mapped will be listed for cross referencing purposes.

Habitat on the Refuge can be separated into four broad types: riverine, wetlands (marsh and wet meadow), riparian (shrub and forested), and upland (sagebrush and mixed low stature shrublands).

The following text provides general information about each of these broad habitats that are displayed on Map 3. Table 3.3 provides acreage of each vegetation type (Berk 1998).

Table 3.3. Vegetation Type and Acreage on Seedskadee NWR, July 1997 (Berk 1998)

Category	Description	Acres
Wetland	Open/ponded Water	174
	Cattail Dominant	31
	Bulrush Dominant	54
	Short Emergents	32
	Mixed Tall Emergents	89
	Perennial Pepperweed	400
	Existing Managed Wetlands	335
	Wetland Subtotal	1,115
Riparian	Grass/Herbaceous	1,629
	Buffaloberry Bush	4
	Willow	322
	Mixed Riparian Shrub	1,134
	Cottonwood Closed[1]/grass understory	75
	Cottonwood Closed/shrub understory	188
	Cottonwood Moderate[2]/grass understory	342
	Cottonwood Moderate/shrub understory	332
	Cottonwood Scattered[3]/grass understory	111
	Cottonwood Scattered/shrub understory	212
	Riparian Subtotal	4,349
Upland	Sagebrush Dominant	15,874
	Greasewood Dominant	218
	Low Stature Shrub	3,120
	Upland Subtotal	19,212
Riverine	Main River Channel	1,254
	Bare Ground/Sand Bars	140
	Riverine Subtotal	1,394
Total Acres Seedskadee NWR[4]		26,070

[1] Closed = greater than 70 percent canopy cover
[2] Moderate = 30 to 70 percent canopy cover
[3] Scattered = less than 30 percent canopy cover
[4] Acreage does not include recent roundouts (current refuge acreage = 26,382)

3.2.4.1 Riverine

Riverine habitats encompass those sites occupied by the active river channel that are directly and dramatically influenced by the seasonal hydrology of the Green River. Riverine habitats are made up of two components denoting the presence or absence of flowing water. Permanent water sites (1,254 acres) encompass only the active river channel and feature flowing water. The remainder of the habitat (140 acres) is gravel bars, sandbars, mud flats, and other similar sites which occur within the active river channel, are not submerged, and which do not support permanent vegetation.

The river provides habitat for waterfowl, raptors, other birds such as gulls and shorebirds, and aquatic species including fish. Due to the influence of Fontenelle Dam, portions of the Green River remain ice-free, providing important wintering habitat for trumpeter swans, bald eagles, and waterfowl.

The vegetation map (Map 3) displays riverine habitat as riverine/palustrine open water. Riverine habitats include the main Green River channel and sandbars/ bare ground (Table 3.3).

3.2.4.2 Wetlands

Approximately 1,115 acres of wetland habitat exists on the Refuge including open water, marshes, and wet meadows (Map 3). Wetland development and management has been the primary focus at Seedskadee NWR since its creation. In the 1980s, approximately 300 acres of wetlands were created in the Hamp, Hawley, Lower Hawley, and Dunkle wetland management units (Map 4 Habitat Management Units). Water from the Green River is diverted through a series of ditches to fill seasonally and permanently flooded wetlands which provide habitat for waterfowl, shorebirds, and other marsh dependent wildlife. This flow-through system returns much of the diverted water back into the Green River.

Wetland management on the Refuge consists of controlling the timing and the extent of water delivery to the units, drawdown of some ponds to produce habitat for shorebird species, occasional dry-down of units to increase aquatic productivity, and prescribed burning to prevent excessive cattail encroachment into open water. A maximum of 50 percent encroachment is desired. Flooding begins in mid-March, after the thaw, and some of the ponds are kept full through the fall. This provides habitat for both spring and fall migrants and breeding waterfowl. Meadows are generally flooded for 2 to 3 weeks in the spring and fall to provide food for shorebirds, cranes, geese, and ducks. The ability to divert water into wetlands relies entirely on elevation of the Green River. During moderate to severe drought, it may be difficult to divert sufficient flows.

Some of the species that use this habitat for breeding include: trumpeter swan, Canada geese, numerous species of ducks, rail species, marsh wren, red-winged blackbird, yellow-headed blackbird, tiger salamander, boreal chorus frog, northern leopard frog, mink, and muskrat. Refuge wetland units are identified as important breeding areas for trumpeter swans in the draft Service "plan for enhancing the Rocky Mountain Population of trumpeter swans on units of the NWR system (2001)."

Seedskadee NWR wetlands may be grouped and described as follows:

Open ponded water encompasses all ponds that are entirely free of permanent emergent vegetation. Open ponded water habitats may be flooded either year-round, seasonally, or according to some management schedule.

Open ponded water habitats provide cover for aquatic wildlife and protection from terrestrial predators for amphibious wildlife. Such habitat also provides herbaceous vegetation, tubers, roots, seeds, fruits, invertebrates, and vertebrate foods . On Seedskadee, vegetative components probably include filamentous algae, coontails, mare's tail, and several species of pondweeds. Floating macrophytes are assumed to be insignificant. Where salinity is high, horned pondweed, widgeon grass, and fennel-leaf pondweed may predominate.

Tall emergent habitats are either cattail-dominant or bulrush-dominant. These marshes are typically flooded to an average depth of up to 2 meters year-round, although depth will vary seasonally. Site vigor depends on periodic drawdowns that oxidize the organic substrate. Vegetation is typically taller than 1 meter above the water surface.

Tall emergent cattail-dominant habitat provides herbaceous forage and tubers for a limited array of wildlife species, as well as, invertebrates and vertebrates. Tall emergent bulrush-dominant habitats provide herbaceous forage, tubers, and seeds, in addition to invertebrates and vertebrates. Both habitats provide dense cover for a variety of wildlife species.

Short emergent habitats are typically flooded to an average depth of less than 0.25 meter for at least three months, although the timing and duration of flooding may vary from year-to-year. Short emergent habitats are characterized by soils that are saturated year-round. Vegetation is generally less than 0.5 meter tall.

Probable associates in short emergent habitats include spikerush, Baltic rush, alkali bulrush, creeping foxtail, reed canarygrass, several sedges, and many others.

Dense, continuous short emergent habitats provide vertical and horizontal cover for many species of wildlife. When flooded, these sites provide herbaceous material, tubers, seeds, and abundant invertebrate foods. When standing water is absent, these sites continue to yield herbaceous and seed resources; however, invertebrates diminish somewhat and terrestrial vertebrates may become more abundant.

The above wetland communities are displayed as Wetlands on Map 3. Vegetation types include open/ponded water, cattail dominant, bulrush dominant, mixed tall emergents, short emergents, and perennial pepperweed vegetation types (Table 3.3).

3.2.4.3 Seedskadee Managed Wetland Units

3.2.4.3.1 Hamp Wetland Unit

The Hamp Wetland Unit is 55 acres and contains a wetland complex of short emergent, tall emergent, and open water determined largely by topography (Map 5). The unit is fed by the Hamp No. 1 headgate, and water gravity flows into the wetland. At flows of 2,000 cfs or greater, adequate water exists to maintain most of the unit at full pool. Pool depths at full pool range from 0.3 to 1.25 meters. Vegetation is dominated by creeping foxtail and perennial pepperweed. Areas of softstem bulrush and spikerush are found along the margins. Open water areas are found adjacent to the dikes and in the ditches. They provide little submerged aquatic vegetation except in the ditches. The unit contains a number of dikes with drop-board water control structures. In reality, this unit is managed together as a whole by adjusting the flow into and out of the wetland unit. Management of individual pools separately is difficult because of the water delivery system.

3.2.4.3.2 Hawley, Lower Hawley, and Dunkle Wetland Units

The Hawley (24 acres), Lower Hawley (147 acres) and Dunkle (36 acres) wetland units each contain a complex of short emergent, tall emergent, and open water (Map 5). The vegetative composition of each of these units is determined largely by the wetland units topography. The units are fed by the Hamp No. 2 headgate, and water flows by gravity into the Hawley Unit first, followed by Lower Hawley and Dunkle Units. At flows of 1,200 cfs or greater, adequate water exists to maintain most of the Hawley unit at full pool. At lower flows, water must be rotated between individual pools to maintain adequate head pressure. At flows less than 1,200 cfs, adequate water may not exist to maintain the Lower Hawley and Dunkle units at full pool. Vegetation in each wetland unit is comprised of a diverse mix of short emergents (spikerush and Baltic rush), tall emergent (cattail and softstem bulrush) and submerged aquatics. Open water areas are found throughout the Hawley unit and provide large amounts of submerged aquatic vegetation. Open water areas in the Lower Hawley and Dunkle Units exists adjacent to dikes and provides limited submerged aquatic vegetation. All wetlands contain a number of dikes with drop-board water control structures. Management of sub-unit pools is difficult because of the water delivery system. The Hawley Unit provides the best opportunity for managing sub-unit pools.

3.2.4.3.3 Pal Wetland Unit

The Pal Wetland Unit is 73 acres and contains a diverse mix of short emergent and tall emergent vegetation (Map 5). Little open water habitat is provided. The unit is fed at the Superior headgate and water gravity flows through the Superior Ditch system. There are no dikes created within the unit. Water flows over low depressions (3 small pools and 1 old river oxbow) within the unit creating a wet meadow habitat. Vegetation is comprised of a mix of short emergent (spikerush and Baltic rush) and tall emergent (cattail and softstem bulrush) vegetation. Water levels drop in the unit as river levels drop.

3.2.4.4 Riparian

Approximately 4,349 acres of riparian habitat (forest and shrub) exist on the Refuge (Map 3). The dominant plant species in this habitat are narrow-leaf cottonwood with an understory of shrubs and grasses. Areas of coyote willow also exist in the riparian corridor. Principal shrub species include: several willow species, Wood's rose, silver buffaloberry, silverberry, skunkbush, golden current, and gooseberry. The riparian habitat type is found predominately along the Green River. The Big Sandy River riparian corridor has no overstory tree habitat.

Several wildlife species that depend on this habitat for breeding include: great blue heron, bald eagle, red-tailed hawk, Swainson's hawk, merlin, kestrel, common merganser, eastern kingbird, willow flycatcher, house wren, yellow warbler, Bullock's oriole, mountain bluebird, northern flicker, moose, beaver, river otter, masked shrew, water shrew, vagrant shrew, and the little brown myotis.

Riparian forests provide critical migrational and breeding habitat for approximately 150 bird species. Forest breeding birds that winter in Central and South America are known as neotropical migrants. Many neotropical migrants are not capable of migrating non-stop through the arid semidesert shrubland that predominates much of Utah, Colorado, and Wyoming. Over 50 neotropical migrant species rely on the north-south riparian forest corridors of the Colorado and Green rivers for feeding, resting or breeding.

Extensive stands of mature narrow-leaf cottonwood clearly distinguish the riparian forest from the surrounding landscape. Field research has confirmed that cottonwood forests are aging and mature trees are in poor health. A comparison of cottonwood forests above and below Fontenelle Reservoir showed forests below the dam had fewer seedlings and saplings, lower tree densities, and reduced tree vigor (Auble and Scott, 1998). Coring of mature cottonwoods in 1996 at two sites below Fontenelle Dam found that the vast majority of trees were well over 100 years in age and only a few were less than 50 years of age (USFWS, 1996 Refuge Narrative). Not only are the mature, aging trees exhibiting stress, but there is not sufficient regeneration to establish a new age class of cottonwoods. The age class diversity within cottonwood forests is not being sustained.

In a 1997 report on Green River refuges, Murray Laubhan of the USGS wrote, "Since construction of dams on the river, the natural extremes in seasonal high and low flows that historically maintained productivity have been lost. Although flows still differ among years, the extremes have been moderated to maintain more stable flows. Stabilization of river flows may have improved the ability to manage cold water fisheries, but there are also many detrimental effects to vegetation and associated wildlife. Obviously, the construction of dams has altered several functional aspects of river hydrology, including: flow regimes, sediment deposition patterns, and rates and types of channel movement. The most obvious impact of these changes has been decreased recruitment and lower vigor of existing riparian vegetation that, in combination, have changed the spatial and structural complexity of the riparian habitat." Additionally, Laubhan reported that stabilization of the river hydrology has reduced the dynamics of off-channel wetlands altering the hydro-periods of palustrine wetlands in the floodplain (Laubhan 1997).

Auble and Scott (1998) presented several plausible explanations for the differences observed between cottonwood forests located above and below Fontenelle Dam. Sediment trapping in the reservoir eliminates deposition of new sediment in the downstream river channel and produces a "sediment hungry" downstream river which may have resulted in downcutting of the river channel. This would place the river surface at a lower than historic elevation and contribute to dewatering of mature trees established prior to dam construction. Field studies verify that maximum tree densities occur at a higher elevation relative to the river surface, below the dam, than above the dam (Auble and Scott, 1998).

Dam and reservoir operation have controlled and modified the natural flows of the Green River. The timing and volume of annual peak flows have changed and unusually high flow flood events have been significantly reduced. For successful natural cottonwood regeneration, high flows would establish a moist seedbed for the cottonwood seeds. High waters would then recede slowly from mid-June through July, the peak cottonwood germination window (see Appendix H). Since 1966, controlled flows peak and decline too rapidly. Under controlled management, peak flows are also lower than historical major runoff events. Current peak flows wet a fraction of the area saturated historically, do not raise water levels high enough to provide sufficient moisture to existing trees, and, absent sediment, do not result in the shifting of stream channels. Channels tend to stabilize. With similar volume peak flow events year-to-year, and no change in channels, subsequent peak flows and river ice tend to sheer off those seedlings which have established (Auble and Scott, 1998).

This decreased cottonwood reproduction is further challenged by grazing pressure from native ungulates and rodents. The loss of reproduction will lead to the eventual replacement of multi-storied forested habitat by a much simpler vegetative structure and lower plant species diversity. This loss of plant structure and diversity will be echoed in a similar loss of wildlife diversity.

The invasion of several nonnative plants is a serious threat to Refuge wet meadows and adjoining riparian areas. Perennial pepperweed, Canada thistle, salt cedar, Russian knapweed, and musk thistle are the most troublesome species. Of these, pepperweed is the most widespread and difficult to control. Currently, the only practical method for controlling pepperweed is with the use of herbicides. Biological control through the release of beneficial insects is under development; however, its approval is not expected for another 10 years. Mechanical control through mowing or grazing can reduce the spread of seed; however, it does little to stress the plant which stores most of its energy underground. Likewise, fire does very little to control the plant. Fire often benefits the plant by reducing competition from the surrounding grasses and forbs. The other weed species are currently found only in isolated patches. They are aggressively controlled through a variety of methods including mechanical, and chemical.

Riparian habitat at Seedskadee NWR includes the following components:

Riparian grass/forb habitats are either regularly flooded in the spring (mid-May through mid-June) or sub-irrigated. Plant species include Rocky Mountain iris, wheatgrass, alkali sacaton, inland saltgrass, bluegrass, wildrye, horsetail, perennial pepperweed, aster, and groundsel.

Riparian shrub communities are characterized by annual flooding cycles (high water mid-May through mid-June) and mineral soils that are saturated for at least part of the year. Riparian shrub sites may include scattered trees so long as mature canopy trees comprise no more than 15 percent total areal coverage. While regenerating cottonwood and willow trees resemble shrub communities in structure, sites dominated by these species in the seedling/sapling stage are classified as riparian forest to reflect their distinct temporal dynamics.

Riparian shrub habitats are described by their species composition and shrub distribution. Willow-dominant habitat occurs where coyote willow dominates the shrub flora. The mixed shrub habitat occurs where other species, such as wild rose, gooseberries, basin big sagebrush, mountain silver sagebrush, redosier dogwood, skunkbrush, silver buffaloberry, and river birch, predominate. In addition, Riparian Shrub habitats may include scattered narrow-leaf cottonwood or peach-leaf willow trees.

Riparian forest habitats are floodplain sites characterized by woody vegetation (greater than 15 percent areal coverage) with the potential to grow greater than 6 meters tall. Like the riparian shrub class, these communities are characterized by historical annual flooding cycles and mineral soils that are saturated for at least part of the year. This habitat type is often dominated by either coyote willow or narrow-leaf cottonwood, which are ecologically similar. Riparian forest sites may include one or more mid-story layers and well-developed shrub or grass/forb layers.

Riparian forest habitats with a 15 to 30 percent canopy coverage in mature trees are described as scattered trees. Riparian forest habitats with greater than 30 percent canopy coverage in mature trees are described as Forest Overstory (closed). These canopied forest habitats may then be described as grass/forb under or shrub under, according to the composition of their understory.

Riparian vegetative communities are displayed as Riparian on Map 3. Vegetation types include grass/herbaceous, willow, mixed riparian shrub, cottonwood closed/grass, cottonwood closed/shrub, cottonwood moderate/grass, cottonwood moderate/shrub, cottonwood scattered/ shrub, buffaloberry bush, and silverberry bush vegetation types (Table 3.3).

3.2.4.5 Upland

Approximately 19,212 acres of semi-desert upland habitats exist on the Refuge (Map 3). These habitat types are generally characterized by varying vegetation communities interspersed with large areas of bare ground, desert pavement, and rocks. The largest block of upland habitat on the Refuge is the Dry Creek Unit. Since 1983, the Dry Creek Unit has been fenced and free of grazing by domestic livestock. These lands are likely returning to an approximation of their condition prior to introduction of livestock.

Special status species utilizing these habitat types include the mountain plover and the burrowing owl. The burrowing owl was a former candidate for listing as endangered or threatened species. Burrowing owls are uncommon and are often associated with areas that have burrows created by white-tailed prairie dogs or some other fossorial species. Mountain plovers are currently proposed for listing as a threatened species and utilize areas that are characterized by short vegetation interspersed with bare ground.

Other wildlife species that rely on this habitat for breeding include: sage grouse, ferruginous hawk, sage thrasher, sage sparrow, loggerhead shrike, short-eared owl, Brewer's sparrow, great basin pocket mouse, and sagebrush vole.

Upland mixed-grass habitats are found in well-drained upland sites and are rarely flooded. Common grass associates include bottlebrush squirreltail, Indian ricegrass, needlegrasses, sandberg bluegrass, Junegrass, and wheatgrasses. Common forb associates include locoweeds, phloxes, lupines, globemallows, prickly pear cactus, and numerous composite species.

The invasion of several nonnative plant species is a serious threat to Refuge and surrounding upland habitats. Cheatgrass, halogeton, and Russian thistle are among the most troublesome. Cheatgrass, an annual, rapidly invades roadsides and disturbed areas because of its winter and early spring growth. When mature, it becomes a fire hazard. Fire favors the growth of cheatgrass, which out-completes native perennial shrubs and grasses after a burn.

Saltgrass habitats are found on mildly saline playas that are flooded for short periods in the spring (mid-April through mid-May). Saltgrass sites are characterized by a preponderance of saltgrass, with alkali sacaton, and whitetop as possible associates.

Upland Shrub habitats include those sites that are dominated by shrubs and have a subsurface water table. Upland Shrub habitats may support standing surface water for some portion of the year.

Four Upland Shrub habitats are described below. The Basin Big Sage community is dominated by basin big sagebrush, which typically grows in comparably moist, well-drained, undisturbed sites with relatively low salinities. These sites are typically confined to draws and arroyos. Woody associates include shadscale, spiny hopsage, rabbitbrush, and plains pricklypear. Common grass and forb associates include those described for Upland Grass/forb communities above. Additional vegetative associates may include desert paintbrush, milkvetch, penstemons, evening primrose, wild onions, and snakeweed. Basin Big Sage communities are characterized by shrubs greater than 1 meter in height covering up to 80 percent of the ground surface. Basin Big Sage often comprises 70 percent of the cover and 90 percent of the plant biomass within this habitat type. Nonnative annual weeds, including halogeton, Russian knapweed, tansy mustard, clasping pepperweed, filaree storksbill, and cheatgrass brome, may be found on disturbed sites.

The Wyoming Big Sage community is dominated by the Wyoming Big Sage, which typically grows in dry, well drained, undisturbed sites with relatively low salinities. Wyoming Big Sage communities may support many of the woody, grass, and herbaceous associates indicated in the Basin Big Sage community. Wyoming Big Sage communities are characterized by shrubs 0.5 to 1.0 meter tall with a lower areal coverage, rarely exceeding 75 percent. Inter-shrub spaces typically support grasses and forbs, although bare soil is also common. Additional vegetative associates include spiny horsebrush, littleleaf horsebrush, four-wing saltbush, spreading fleabane, and phlox. The Wyoming Big Sage community represents the dominant vegetative type in the uplands.

Short Shrub communities are characterized by a variety of widely spaced woody shrubs less than 0.5 meter (often less than 0.2 meter) tall. Areal shrub coverage is typically less than 50 percent and inter-shrub spaces are typically bare soil. This community typically occurs on dry upland sites with moderate to highly alkaline soils. Common shrubs include Wyoming big sage, black sagebrush, and shadscale. Species composition varies on a comparably small spatial scale. Sages, shadscale, and other similar shrubs dominate patches according to local soil conditions, thermal environment, hydrology, and disturbance. Grass and forbs are not abundant but may include needlegrasses and pussytoes.

The Greasewood community is dominated by greasewood, which dominates seasonally flooded lowlands where the water table is within 1 meter of the soil surface and where soils are moderately saline. The Greasewood community is characterized by widely spaced shrubs 0.5 to 1.0 meter tall, with a generally low areal coverage rarely exceeding 75 percent. This classification system assumes flooding occurs for a short period in April. Like the Short Shrub community, grass and forbs are uncommon and feature many of the same species. Additional associates also include saltgrass, Baltic rush, alkali sacaton, and possibly pickleweed on the most alkaline sites.

The upland communities are mapped as Upland on Map 3. Vegetation types include sagebrush Dominant, greasewood dominant, and low stature shrub (Table 3.3).

3.2.4.6 Other Habitat Features

A number of western wildlife species are associated with distinct landscape features. This classification system recognizes two geomorphic features: Bare Rock/Soil and Cliffs/Outcrops. Cliffs and Outcrops may be further subdivided as Bedrock or Unconsolidated to reflect their substrate stability. Some wildlife species associated with these features include various bat species, golden eagle, peregrine falcon, prairie falcon, bank swallow, and Northern rough-winged swallow. Four anthropogenic features merit attention: Fences, Roads, Powerlines and Buildings (including bridges).

3.2.4.7 Threatened, Endangered, Candidate or Wyoming Plant Species of Special Concern

Table 3.4 identifies federally threatened, endangered or candidate and Wyoming listed plant species of special concern which may occur on the Refuge because suitable habitat currently exists.

Table 3.4 Plant species which may occur on Seedskadee National Wildlife Refuge which are Threatened, Endangered, Candidate or of Special Concern in Wyoming.

Common Name	Latin Name	Heritage Rank Federal and/or State Status	Located on Refuge
Ute ladies'-tresses orchid	*Spiranthes diluvialis*	USFWS Threatened G2/S1	None found
Rollins' cat-eye	*Cryptantha rollinsii*	G4/S1	No Record
Wilcox's woollystar	*Eriastrum wilcoxii*	G5/S1S2	No Record
Juniper prickly-pear	*Opuntia polyacantha var. juniperina*	G5T3?Q/S1	No Record
Nelson's milkvetch	*Astragalus nelsonianus*	G2/S2	No Record
Dwarf milkweed	*Asclepias uncialis*	G3?/SH	No Record

Several plant surveys by qualified botanists have been conducted to record the flora of Seedskadee NWR. The Ute ladies'-tresses has been of specific interest. The distribution of this species is believed to be limited to wet meadow habitats and, to date, has not been found on the Refuge.

3.2.5 Wildlife Resources

Seedskadee's habitat diversity is reflected in its broad diversity of wildlife. The Refuge's wetland and riparian habitats are unique to the surrounding predominantly dry upland habitat. This oasis-like setting is a valuable habitat for numerous resident and migratory species.

As part of the CCP planning process, a report was prepared, "Seedskadee National Wildlife Refuge Wildlife - Habitat Matrix and Species Accounts" (Pioneer Environmental Services, 1997). The Pioneer (1997) report lists each of the species known or suspected to use the Refuge, and estimates what time of year specific habitat(s) are utilized by each species. The matrix is useful in understanding the wildlife value of each habitat type found on Seedskadee National Wildlife Refuge.

Except for Threatened, Endangered and Candidate Species and Species of Special Concern, only those species that are residents or frequent visitors to Seedskadee are discussed in the following text. Many other species, birds in particular, may infrequently inhabit or migrate through the Refuge. Species lists for birds, mammals, fish, amphibians, and reptiles are found in Appendix F. Additional information is available from the Seedskadee National Wildlife Refuge Wildlife - Habitat Matrix and Species Accounts located in the Project File at Seedskadee National Wildlife Refuge.

3.2.5.1 Avian

Waterfowl - ducks, geese, and swans: A great number of migratory water birds rely on the Refuge's wetland, riverine, and marsh habitats for foraging and resting during spring and fall migration. The habitats utilized depend upon the species, their life stage, and the time of year. The most common species of ducks breeding on the Refuge include mallard, gadwall, and cinnamon teal.

Most of the ducks common to the Refuge use all four broad habitat types; riverine, wetland/marsh, riparian, and upland. These ducks include the green-winged teal, mallard, northern pintail, blue-winged teal, cinnamon teal, northern shoveler, gadwall, and American wigeon.

The lesser scaup, canvasback, redhead, ruddy duck and bufflehead rely upon riverine habitats and open ponded water.

The Barrow's goldeneye, common goldeneye, and common merganser utilize riverine and wetland habitats along with the riparian forest and its tree cavities.

The Canada goose is an abundant year-round resident of Seedskadee NWR utilizing riverine, wetland/marsh, and grass/forb habitats.

The trumpeter swan uses open ponded water, marsh, and riverine habitats. Trumpeters use the Refuge for migration, breeding and as critical wintering habitat. During winter, the open river water that exists between Fontenelle Dam and Highway 28 provides good foraging and loafing habitat when all other wetland areas are frozen. As many as 36 trumpeter swans (2000) have been observed wintering on the Refuge in addition to numerous tundra swans. Trumpeter swans were reintroduced to the Green River drainage through the trumpeter swan range expansion program. A total of 70 cygnets and adults have been released on Seedskadee NWR from various capture sites (Table 3.5). The first successful nesting attempt occurred in 1997 and fledged five cygnets from Seedskadee NWR. One cygnet was fledged in 1998 and four were fledged in 1999 and 2000, respectively. Two pairs successfully nested on the Refuge for the first time in 2001 producing a total of five cygnets.

The Service has developed a draft plan for "Enhancing the Rocky Mountain Population of Trumpeter Swans on units of the National Wildlife Refuge System" (2001). Seedskadee NWR is included in the Plan and is recognized as an area providing suitable migration, breeding and wintering habitat. The plan, when finalized, will help to prioritize significant areas and projects relative to their importance for maintaining and improving the Rocky Mountain Trumpeter Swan Population.

Table 3.5. Re-introductions and nesting history of trumpeter swans on Seedskadee National Wildlife Refuge (Data from Refuge swan files and Trumpeter Swan Society)

Year	# Re-introduced	# Nests	# Cyngets Hatched	# Cygnets Fledged
1992 summer RRL[1]	5 Adults 5 Cygnets	0	0	0
1992-93 winter HSP	19 Adults 19 Cygnets	0	0	0
1993-94 winter HSP	5 Adults 11 Cygnets	0	0	0
1996 WYWS	4 Adults			
1997 WYWS	2 Juveniles	1	5	5
1998	0	1	4	1
1999	0	1	4	4
2000	0	1	4	4[2]
2001	0	2	5[3]	[4]
Totals	70	4	17	14

[1] Areas swans were introduced from:
RRL= Red Rock Lakes National Wildlife Refuge;
HSP= Harrim State Park;
WYWS= Wyoming Wetland Society Trumpeter Swan Fund.
[2] One cygnet lost in winter due to a fishing lure stuck in its bill.
[3] One nest produced 4 cygnets and the other nest hatched 1 cygnet
[4] Still evaluating - too early in season

Wading birds are water birds that usually do not swim or dive for their prey, but wade in shallow edges of lakes, ponds, creeks and other waters for food not available on shore. The great blue heron, white-faced ibis, and sandhill crane are wading birds common to Seedskadee NWR. The heron and ibis use the broad range of Refuge habitats, foraging in wetlands and shallow riverine areas and nesting over water in cottonwood trees or tall shrubs. Sandhill cranes utilize both wetland/marshy areas and grass/forb habitats for both foraging and nesting.

Shorebirds are most often found foraging for food along water margins. Shorebirds use the Refuge during migration and also for nesting. Shorebirds frequent open water areas, riverine, and wetland habitats on the Refuge. Common shorebird species utilizing Seedskadee NWR include: killdeer, spotted sandpiper, greater and lesser yellowlegs, willet, long-billed dowitcher, Wilson's phalarope, and common snipe.

Divers or swimmers are water birds that swim or dive for their prey. The common merganser, pied-billed grebe, and American coot use open water areas, tall emergent marshes, and nest on the Refuge. The double-crested cormorant and American white pelican subsist on a diet of fish and frequent riverine and open-water habitats. Exposed river rocks, cottonwood trees, and graveled shorelines provide roosting habitat.

Raptors consist of several families of hawks and owls. Raptors common to Seedskadee NWR include the northern harrier, Swainson's hawk, red-tailed hawk, rough-legged hawk, golden eagle, American kestrel, and the great horned owl. The bald eagle is a common year-round resident. Raptors utilize a variety of wetland, riparian, and upland habitats to forage and nest. The old growth cottonwood trees are heavily utilized by red-tailed hawks, bald eagles, American kestrel, and great horned owls. The abundant small mammal and fish populations supplied by the Refuge provide an excellent forage base for all raptors.

Upland bird species rely primarily on upland habitats. Several of the more common upland bird species include sage grouse, horned lark, and mourning dove. The sage grouse and horned lark are year-round resident species. The sage grouse prefers Wyoming Big Sagebrush communities. The mourning dove is a summer resident that nests in riparian or upland areas and forages primarily in moist riparian or upland grasslands.

Neotropical migrants are birds that breed in North America, but winter in Central and South America or the West Indies. The following species are those that are more commonly found on the Refuge during migration, but many nest on the Refuge as well. With only a few exceptions, these birds rely heavily upon riparian habitats, riparian shrub and/or forest, for cover, foraging, and roosting during their stay on the Refuge. Swallows on the Refuge use a combination of habitats including wetland/marsh, open water, riverine, riparian shrub, forest, and grass/forb communities. The tree swallow and violet-green swallow nest in trees and tree cavities. Northern rough-winged swallow, cliff swallow, and barn swallow, rely on cliffs, river banks or rock outcrops for nesting. The riparian shrub and forest habitats are the primary habitats utilized by the rufous hummingbird, cordilleran flycatcher, western kingbird, eastern kingbird, western wood-pewee, hermit thrush, warbling vireo, yellow warbler, yellow-rumped warbler, Wilson's warbler, northern oriole, house wren, Lincoln sparrow, common yellowthroat, and western tanager. A few of these species also use the grass/forb, upland shrub, or emergent marsh for foraging. The common nighthawk and brown-headed cowbird use a combination of almost all the habitats found at Seedskadee NWR. The marsh wren's habitat is tall emergent marsh; the vesper sparrow uses the grass/forb and upland shrub communities; and the savannah sparrow utilizes short emergent marsh and grass/forb communities. Primary nesting habitat for the belted kingfisher, rock wren, and Say's phoebe consists of cliffs and outcrops. The kingfisher forages in nearby open water, while the rock wren and phoebe tend to forage in upland shrub and grass communities.

Woodpeckers are small and medium sized insectivorous birds with stiff tails and specially adapted skulls and tongues. The northern flicker is the most common woodpecker. This species inhabits the riparian forest's large-diameter trees and standing dead wood. It also uses upland shrub and grass/forb habitats. Other less common woodpeckers include downy, and hairy woodpeckers and the red-naped sapsucker.

Resident and migrant songbirds breed in North America and migrate throughout a limited North American range. This group includes the mountain bluebird, American robin, dark-eyed junco, white-crowned sparrow, pine siskin, and American goldfinch that use both riparian and upland habitats. The western meadowlark, sage thrasher, Brewer's sparrow, and sage sparrow predominantly use upland habitats. Species like the ruby-crowned kinglet and the black-capped chickadee use primarily the riparian forest/shrub habitat. Three blackbirds (the red-winged, yellow-headed, and Brewer's) utilize dense wetland marsh for nesting and foraging. The Brewer's blackbird will also utilize riparian shrub/forest and upland shrub for foraging and migration habitat. The song sparrow often nests near permanent open-water, in dense riparian shrub, dense regenerating forest, or dense upland shrubs. Forage habitat for the song sparrow is in adjacent marsh and riparian meadows.

3.2.5.1.1 Predator Management and Nest Success

Seedskadee NWR controls mammalian predators in most wetland units to enhance nesting success for ground-nesting birds. Predators targeted for trapping include red fox, skunk, and raccoon. Coyotes are not trapped as research indicates they are not as effective of nest predators as other predator species, and they tend to suppress or displace fox populations. Ground-nesting birds which benefit include waterfowl, shorebirds, sage grouse, meadowlarks, sparrows, colonial nesting birds, northern harriers, etc.

Nest success, with and without predator trapping, is a measure of success of the predator control program for waterfowl production and the production of other ground-nesting birds (Table 3.6). Apparent success is calculated as the number of successful nests observed divided by all nests observed. Mayfield nest success (found in row 1) takes into account the number of days the nest is exposed to predation and, therefore, is a more accurate measure of the actual nest success. The Mayfield index is almost always substantially less than apparent success.

Table 3.6 Nest Success Compared With Trap Effort on Seedskadee National Wildlife Refuge (1987-1998)

Nest Success	1987[1]	1988	1989	1990	1993	1998
Mayfield Success	5%	45%	70%	51%	34%	25%
Apparent Success	14%	63%	84%	71%	58%	50%
Total Nests Observed	60	92	113	129	95	83
Trap Nights	0	5,679	5,919	5,292	4,710	3,100
Total Predators	0	97	65	63	59	36
Number of trap nights/predator captured	0	59	91	84	88	86

[1] No trapping conducted prior to 1987 - data for 1987 represents nest success prior to implementing a predator management program.

3.2.5.2 Mammals

Big game species common to the area are pronghorn, mule deer, and moose. Although less than 1 percent of Wyoming is classified as riparian, almost 80 percent of its wildlife require riparian areas for critical portions of their life cycle. The Refuge (with adjacent BLM lands) supports a herd of approximately 20 to 40 moose and 140 mule deer. Mule deer range throughout the area, but concentrate in greater numbers within the Refuge riparian zone. Moose forage extensively on willows and shrubs associated with the Refuge's riparian habitat and also utilize the Refuge for breeding and calving. Pronghorn range year-round throughout most of the areas below 7,000 feet. The Refuge lies within the range of the Sublette Antelope herd (approximately 49,000 animals), which is one of the largest migratory ungulate herd sin the lower 48 states.

Many small mammals are present within the Refuge and utilize all habitat types depending on their life requisites. More common species include dusky shrew, little brown myotis, cottontail rabbit, white-tailed jackrabbit, least chipmunk, Wyoming ground squirrel, white-tailed prairie dog, Northern pocket gopher, deer mice, beaver, meadow vole, muskrat, porcupine, coyote, red fox, raccoon, badger, and striped skunk. Other small animals that may be found on the Refuge, but are less common, include the long and short (ermine) tailed weasels, otter, pygmy rabbit, marmot, mink, and bobcat (Appendix F).

3.2.5.3 Fish

Two main types of aquatic communities are present on Seedskadee NWR: 1) those which occur in the Green River and its perennial tributaries, principally the Big Sandy River, and 2) those which occur in ponds along the lower terraces. The following fish are commonly found in the Green River and its tributaries: rainbow trout, Snake River cutthroat trout, Bonneville cutthroat trout, kokanee salmon, brown trout, mountain whitefish, mottled sculpin, white sucker, flannel-mouthed sucker, Utah chub, Bonneville redside shiner, and speckled dace. Other less common species are listed in Appendix F.

Prior to construction of Fontenelle Dam, the stretch of Green River included within the Refuge was characterized as a poor quality fishery with high turbidity and sediment filled streambeds. As a result of Fontenelle Dam, the Green River is now a clear, gravel bottomed River and provides excellent habitat for trout. The fishery resource on Seedskadee NWR is managed jointly by the Refuge and the Wyoming Game and Fish Department (Map 6).

The chief limiting Refuge habitat factors for trout are the lack of deep pools, lack of bank cover, and the potential for rapidly fluctuating flows from Fontennelle Reservoir. These habitat factors are important to ensure over winter survival and successful spawning. Winter mortality is high. Small size fish suffer the highest mortality, especially stocked fish. For this reason, the Wyoming Game and Fish Department has reduced their expenditure and effort in stocking. Rainbow trout were stocked in May 1996 at a rate of 430 subcatchables per mile totaling 15,000 fish (average length of 6 inches). Cutthroat trout were stocked at a rate of 290 advanced fingerlings per mile for a total of 10,000 fish (average length 3 inches). In mid-June 1996, 6,000 advance fry cutthroat were stocked upstream and downstream from the McCullen Bluff sill. Recent research on the Wind River indicates that "frazil ice" forming below the dam is causing physical harm to trout and injuring the gills of fish. Deeper holes help fish to avoid this fine, free floating ice. The Wyoming Game and Fish Department continues to conduct spring electroshocking on the Refuge to determine population levels.

Brown trout were stocked in the Green River on Seedskadee NWR until 1993. After 1993, brown trout stocking was discontinued after it was determined from electroshocking that natural reproduction was sustaining the fishery.

Wyoming Game and Fish records indicate that Kokanee salmon were first stocked in Flaming Gorge Reservoir in 1989 as a new forage species for lake trout. A small population likely existed in the Green River system before 1989 because of downstream drift from lakes in the Pinedale, Wyoming, area. The first Kokanee were stocked in the Green River in 1991. They now produce a reliable run through Seedskadee NWR that terminates at Fontenelle Dam. Many of the Kokanee running the Green River were established from releases out of the hatching facility on Flume Creek. Since natural, successful spawning does not appear to be substantial the WYG&F spawns the Kokanee, hatches the eggs, and then restocks the Green River. Two different strains were stocked ,and as a result, two different spawning runs were produced in September and late October/November.

3.2.5.4 Reptiles and Amphibians

Known species diversity of reptiles and amphibians is low. Amphibians include the tiger salamander, Great Basin spadefoot toad, northern leopard frog, and the boreal chorus frog. The tiger salamander and the spadefoot toad utilize a combination of habitats including marsh, wetland, and riverine areas as well as upland shrub communities near open water. The frogs are found along vegetated margins of riverine permanent water, open ponded water, and tall emergent marshes. Other wetland and riparian areas may be used when close to water or flooded.

Reptiles found at Seedskadee NWR include the many-lined skink, northern sagebrush lizard, eastern short-horned lizard, and the wandering garter snake (Appendix F). The many-lined skink can be found in upland grasses with moist subsoils, riparian grass/forb, riparian shrub, riparian forest, basin big sagebrush, and Wyoming big sagebrush communities. The lizards are likely to be found in upland shrub and grass habitats and particularly in rock outcrops. The eastern yellowbelly racer and the gopher snake prefer upland grass/forb habitats, upland shrub, riparian meadows, and open riparian forests with rocky outcrops which are important for overwintering. The garter snake's habitat is similar, but also includes tall and short emergent marshes or upland habitats which are near to open water.

3.2.5.5 Invertebrates

Data has not been gathered on invertebrates. Incidental observations reveal that mosquito populations, though somewhat cyclical with drought cycles, can be extremely high on the Refuge. Aquatic and terrestrial invertebrates are an essential component in the food chain for Seedskadee wildlife.

3.2.5.6 Threatened, Endangered and Candidate Species, and Other Wildlife Species of Special Concern:

Table 3.7 lists special status wildlife and fish species that are known to use habitat types which currently or formerly occurred at Seedskadee NWR. A special status species would be one that is listed as an Endangered Species, Threatened Species, Candidate Species, and Species of Special Concern (The Nature Conservancy, Wyoming Game and Fish Department, Wyoming Partner's In Flight).

Table 3.7 Special Status Wildlife and Fish Species Potentially Occurring on Seedskadee NWR

Common Name	Seasonal Occurrence[1]	*Scientific Name*	Heritage Rank[2]	Federal and State Status[2]	Date Last Observed[3]
BIRDS					
Clark's grebe	M	*Aechmophorus clarkü*	G5/S2B,SZN	WYGF SSC4 PIF-L1	WOL1998
Western grebe	M, SR	*Aechmophorus occidentalis*		WYGF SSC4 PIF-L1	WOL2001
American bittern	M, PB	*Botaurus lentiginosus*	G4/S2B,SZN	WYGF SSC3	WOL1990
Black-crowned night-heron	M	*Nycticorax nycticorax*		WYGF SSC3	WOL2000
Snowy egret	M	*Leucophoyx thula*		WYGF SSC3	WOL2000
White-faced ibis	SR, M, PB,	*Plegadis chihi*	G5/S1B,SZN	WYGF SSC3	WOL2001
Whooping crane	M	*Grus americana*	G1/S1N	USFWS Experimental	WOL1991
Trumpeter swan	B, YR	*Cygnus buccinator*	G4/S1B,S2N	WYGF SSC2 PIF-L1	WOL2001
Mountain plover	M, PB	*Charadrius montanus*	G2/S2B,SZN	USFWS Proposed Threatened WYGF SSC4 PIF-L1	WOL1995
Long-billed curlew	M, PB	*Numenius americanus*	G5/S3B,SZN	WYGF SSC3 PIF L-1	WOL1998
Wilson's phalarope	B, M	*Phalaropus tricolor*	G5/S3B,S3N	PIF-L1	WOL2001
Caspian tern	M, SR	*Sterna caspia*	G5/S1B,SZN	WYGF SSC3	WOL2000
Forster's tern	M	*Sterna forsteri*	G5/S1B,SZN	WYGF SSC3 PIF-L1	WOL1986
Black tern	M, PB	*Chlidonias niger*	G4/S1B,SZN	WYGF SSC3 PIF-L1	WOL1993
Bald eagle	B, YR	*Haliaeetus leucocephalus*	G4/S2B, S3N	USFWS Threatened (proposed delisting) WYGF SSC2 PIF-L1	WOL2001
Northern goshawk	M	*Accipiter gentilis*	G5/S23B,S4N	WYGF SSC4 PIF L-1	WOL1991
Swainson's hawk	B, M	*Buteo swainsoni*		PIF-L1	WOL2000
Ferruginous hawk	B, M	*Buteo regalis*		WYGF SSC3 PIF-L1	WOL2001
Merlin	M, PB	*Falco Columbarius*	G5/S2B,SZN	SSC3 PIF-L1	WOL1994
Peregrine falcon	M, PB	*Falco peregrinus anatrum*	G4T3/S1B,S2 N	USFWS Delisted/ WYGF SSC3 PIF-L1	WOL2000

Table 3.7 Special Status Wildlife and Fish Species Potentially Occurring on Seedskadee NWR					
Common Name	Seasonal Occurrence[1]	*Scientific Name*	Heritage Rank[2]	Federal and State Status[2]	Date Last Observed[3]
Sage grouse	B, YR	*Centrocercus urophasianus*		PIF-L1	WOL2000
Short-eared owl	B, YR	*Asio flammeus*	G5/S2S3	PIF-L1	WOL2001
Burrowing owl	PB, YR	*Athene cunicularia*	G4/S3B, SZN	WYGF SSC4	WOL1994
Lewis' woodpecker	M	*Asyndesmus lewis*	G5/S2B,SZN	WYGF SSC3 PIF-L1	WOL1986
Yellow-billed cuckoo	M, PB	*Coccyzus americanus*	G5/S2B,SZN	WYGF SSC2	WOL1994
Brewer's sparrow	B, M	*Spizella breweri*	G5/S3B, SZN	PIF-L1	WOL2001
Sage sparrow	B, M	*Amphispiza belli*	G5/S3B,SZN	PIF-L1	WOL2001
FISH					
Colorado Pikeminnow	No Record	*Ptychocheilus lucius*	G1/SX	USFWS Endangered	No Record
Humpback Chub	No Record	*Gila cypha*	G1/SX	USFWS Endangered	No Record
Bonytail Chub	No Record	*Gila elegans*	G1/SX	USFWS Endangered	No Record
Bluehead sucker	YR	*Catostomus discobolus*	G4/S2S3		No Record
Flannelmouth sucker	YR	*Catostomus latipinnis*	G3G4/S3		No Record
Razorback sucker	No Record	*Xyrauchen texanus*	G1/SX	USFWS Endangered	No Record
MAMMALS					
Long-eared myotis spotted bat	SR, M	*Myotis evotis*	G5/S1B,S1?N	WYGF SSC2	BMN1994
Townsend's big-eared bat	No records	*Corynorhinus townsendii*	G4/S1B,S2N	WYGF SSC2	No Records
Pallid bat	SR, M	*Antrozous pallidus*	G5/S1B,SZ?N	WYGF SSC2	BMN1994
Pygmy rabbit	B, YR	*Brachylagus idahoensis*	G4/S2	WYGF SSC3	WOL1991
Swift fox	No records	*Vulpes velox*	G3/S2S3	WYGF SSC3	No Records
Black-footed ferret	No records	*Mustela nigripes*	G1/S1	USFWS Endangered	1976-78
River otter	YR, PB	*Lontra canadensis*	G5/S3		WOL2001

[1] Seasonal occurrence: B = Breeding (assumes summer resident); PB = Possible or Potential Breeding (no confirmed records); SR = summer resident (no evidence of breeding); YR = year-round resident; M = Migrant

[2] See Glossary for special status definitions.

[3] WOL = Refuge Wildlife Observation Log; BMN= Refuge bat mist netting records; WFS=Refuge waterfowl surveys. #'s indicate year last observed. Includes data through 2001.

Three federally-listed bird species have been observed on the Refuge. The bald eagle is a year-round resident and nests annually (Table 3.8). Bald eagles use riparian forest habitat on the Refuge year-round. Mature cottonwoods provide nest and perch sites for the bald eagles, where they hunt for fish, waterfowl, and carrion along the Green River. The fish and ducks in the river provide an important food source for the bald eagle. Approximately 25 eagles spend the winter on the Refuge each year.

Table 3.8. Bald Eagle Production on Seedskadee NWR (data from Refuge bald eagle observations file)

Year	# Nests Active[1]	# Successful Nests	# of Young Hatched	# of Young Fledged
1992	1	1	2	2
1993	0	0	0	0
1994	1	0	0	0
1995	3	0	0	0
1996	2	0	0	0
1997	2	2	4	3
1998	2	2	4	4
1999	4	2	6[2]	2
2000	3	3	6	6
2001	3	3	7	7

[1] An active nest = birds initiated nest building, but may not have progressed further.

[2] One of the successful nests produced 3 young, but the nest and chicks were destroyed when the nest fell out of the tree.

The peregrine falcon and whooping crane have been observed on the Refuge infrequently during migration. For four consecutive years (1996 to 2000), one peregrine sighting was recorded in the Tallman, Hay Farm, and Hawley management units, respectively. Maintenance of migration habitat is important for these species. Whooping cranes have infrequently been observed on the Hawley wetland unit (1991). The birds are suspect migrants. The four federally-endangered fish species have not been recorded as occurring within the Refuge. Prior to Fontenelle Dam these fish may have occurred as far north as Green River, Wyoming. These native fish require turbulent rivers with great extremes of flow, temperature, and turbidity. Such conditions no longer exist below Fontenelle Dam.

The federally-endangered black-footed ferret has been observed on the Refuge historically. The current population of white-tailed prairie dogs that occurs on the Refuge is one of the ferret's preferred prey items but current prairie dog populations may not be big enough to sustain a ferret population. The Refuge staff continues to monitor for the presence of this species.

The white-faced ibis, black tern, and the American bittern are Species of Special Concern that have been observed utilizing Refuge wetland/marsh habitat. The white-faced ibis is now a common migrant seen in the spring and fall. The American bittern and black tern are infrequently observed in migration.

The northern goshawk is a former candidate species for consideration of listing as federally endangered or threatened. Northern goshawks are rare migrants on the Refuge. Numerous sightings on the Wind River and Wyoming mountain ranges indicate that the Green River may occasionally be used as a migration corridor between summer and winter range.

The Service (July 2001) has determined that the yellow-billed cuckoo in the western United States, roughly west of the Rocky Mountains, meets the criteria to qualify as a "distinct population segment" (DPS), and, as such, may be proposed for listing. As a result of this finding, the Service will add the western DPS of the yellow-billed cuckoo to the list of species that are candidates for listing under the Endangered Species Act. The cuckoo migrates through and breeds on the Refuge in small numbers. It breeds in willow and cottonwood forests along rivers and streams. Populations are in decline primarily as a result of destruction of their streamside habitat.

The merlin falcon is a Species of Special Concern. Some of the last recorded breeding territories for merlins on the Green River were located on the Refuge. Merlin nesting has not been documented on the Refuge since the late 1980s. A 1999 survey detected no sign of merlins during the breeding season.

The mountain plover, a proposed threatened species, is known to use Refuge lands or lands adjacent to the Refuge. The Refuge staff monitors the Dry Creek Unit annually to look for breeding or migrating birds.

State listed species known to use Refuge lands or lands adjacent to the Refuge include: pygmy rabbit, trumpeter swan, American white pelican, ferruginous hawk, burrowing owl, and long-billed curlew. Trumpeter swans now utilize the Refuge for breeding, migration, and as wintering habitat (Table 3.5).

Other state listed species that have a potential to occur on the Refuge include: long-eared myotis, Townsend's big-eared bat, pallid bat, snowy egret, Clark's grebe, western grebe, Caspian tern, Forester's tern, black-crowned night-heron, and Lewis' woodpecker.

3.2.6 Cultural Resources Inventory

The western Wyoming Basin and the vicinity of today's Seedskadee NWR has a sequence of uninterrupted human use, at least since the Folsom times (10400 to 10800 BP), and perhaps dating even further back. At least one surface find of Clovis (10600 to 11900 BP) is documented by Frison (1978) (Miller and Kornfeld, 1996). The people who passed through or used the resources of these lands over thousands of years left evidence of their occupation. Within the past 150 years, fur trade and pioneer migrations west brought European peoples through the region resulting in the eventual establishment of trading centers, private landownership, and communities. As with prehistoric occupation, these historic uses left behind evidence of their presence at Seedskadee, including trail remnants, old outposts, and ranch structures (Map 7). Seedskadee NWR's dune formations are rich in artifacts from prehistoric use, and the Refuge has numerous historic sites.

These artifacts provide opportunities to add to the body of knowledge about prehistoric and historic peoples and to also learn more about how these lands and resources were utilized by both prehistoric and historic occupation.

3.2.6.1 Prehistoric

The Wyoming Basin was occupied by small groups of hunter-gatherers at the band level of organization. They practiced seasonal movements which optimized the procurement of resources including food, water, shelter, and raw materials such as toolstone. Movement coincided with seasonal availability for critical resources. Aboriginal populations became more familiar with certain plant species through time and gradually incorporated them as part of their subsistence strategy.

Three broad cultural periods are recognized in the western Wyoming Basin, generally corresponding to those established for the Northwestern Plains by Frison (1978,1991): Paleoindian, Archaic, and Late Prehistoric. The Paleoindian Period (12000 to 8000 BP) sites are dominated by bison bone beds and the subsistence is interpreted as being dependent on big game (such as camel and mammoth), specifically on extinct species. The Archaic Period (8000 to 2000 BP) is characterized by a Pan-American broad-based subsistence strategy. The Archaic Period is subdivided into Early, Middle and Late subperiods based on differences in projectile point styles and associated with minor differences in subsistence. The Late Prehistoric Period (2000 to 250 BP) is defined by the introduction or innovation of the bow and arrow as well as the production and use of ceramics (Miller and Kornfeld, 1996).

During the Paleoindian Period, lush grasslands and savanna-like conditions existed with notably higher precipitation supporting large herbivores such as the mammoth, horse, and extinct forms of bison. This period is distinctive for its meticulous workmanship of projectile points. The point styles serve as chronological indicators within the period (Thompson and Pastor, 1995).

The Archaic Period is characterized by reduced precipitation and warmer than average temperatures. Megafauna (horse, camel, mammoth, and bison) became extinct or smaller. Hunters had to target smaller animals. The large stemmed lanceolate projectiles were replaced with smaller side and corner notches dart points. A greater use of vegetable foods occurred during this period. Summer occupation in the mountains, winter occupation in the foothills, and spring and fall movements utilized all available zones. Early Archaic subsistence strategies centered around pronghorn, rabbits, and other small animals. Late Archaic subsistence strategies included more bison, but still focused on pronghorn, rabbits, and other small animals. Ground stone is common in both periods (Thompson and Pastor 1995).

The Protohistoric Period began with the first European trade goods reaching the area (300 years BP) and ended with the development of the Rocky Mountain fur trade 150 years ago. Protohistoric sites often contain trade goods such as glass trade beads and metal artifacts. The most important impact on Native American cultures during this period was the introduction of the horse in the early 1700s. Hunting bison became more efficient and cultural material was easier to transport (Thompson and Pastor 1995).

Evidence of housepits or other types of living structures are present in the archaeological record since paleoindian times. Structures were identified at the Agate Basin sites in eastern Wyoming from the Folsom period (ca. 10,600 BP) and the use of housepits has been documented to the Early Archaic. Stone circle (tipi ring) sites date from the Middle Plains Archaic through the historic period.

3.2.6.2 Historic

It was the Shoshone Indians that gave the Green River its first name "sisk-a-dee-agie" or "River of the Prairie Chicken." Fur traders later corrupted the Indian name to "Seedskadee." Shoshone Indians hunted "prairie chickens" (sage grouse), as well as deer, pronghorn, and other wildlife along the banks of the Green River. The River corridor contains many significant archaeological sites. Early explorers and mountain men trapped beavers extensively in the Seedskadee area.

Thousands of pioneers crossed the Green River on what is now Seedskadee NWR. The Oregon and Mormon Trails, which cross the Refuge, have been designated as National Historic Trails by Congress. Ruts from these trails are still visible on the Refuge today. The Pony Express Trail also crosses the Refuge. Jim Bridger and others operated ferries on the Green River in the 1840s and 1850s. Settlement of the area by stockman began with the arrival of the railroad in 1868. The remains of numerous homesteads are located along the River (Map 7).

Known cultural resources are fragile and highly susceptible to vandalism. Old homesteads are particularly susceptible to fire. The lack of adequate funding, existing and anticipated, precludes stabilizing these structures and sites. In compliance with current Federal legislation, it is necessary to document them as thoroughly as possible before they deteriorate further from natural and other causes.

3.2.6.3 Lombard Ferry

Lombard Ferry, named after Wiilliam Lombard, who operated ferries at the site in 1889, was probably the main crossing of the Green River used by Oregon Trail emigrants and thus represented a landmark in many travel diaries as well as a difficult crossing site. During low water periods, wagons could ford the River on a shallow sand bar only 10 feet wide. Divergence from the shallow sand bar led to many a wet wagon and several watery graves. After the initial Mormon trek to the Salt Lake Valley in 1847, the Latter Day Saints quickly realized the importance of establishing a ferry operation for following Mormon trains, and the ensuing ferry capitalized upon the Oregon Trail emigrants by charging three to four dollars per wagon. Several other ferry operations followed in later years, and as late as 1943, the site was marked by the ruin of several stone buildings.

Today, the Lombard Ferry crossing, located 42 miles west of Parting-of-the-Ways is marked with five interpretive panels, a graveled parking area, and a paved pedestrian path (Map 7 and 8a). Access to the site is south of Highway 28. Interpretive panels describe the significance of the site. Lombard Ferry has been identified as a historic site for the Mormon Pioneer National Historic Trail.

Management plans and implementing actions have been prepared by the National Park Service (NPS) for both the Oregon and Mormon Pioneer National Historic Trails. The Fish and Wildlife Service Regional Historian has reviewed these plans and assured NPS that trail routes across the Refuge will be preserved and the Lombard Ferry Site would be preserved and interpreted.

3.2.6.4 Paleontological Resources

The Bridger and Green River formations are exposed geologic formations that are found on the Refuge. These formations have yielded paleontological resources at other locations. Table 3.9 summarizes the resources in the area.

Table 3.9. Summary of Surface Geologic Deposits and Paleontological Resources, Seedskadee NWR Area (summarized from material provided by Gustav F. Winterfeld, Ph.D., who provided assistance with the paleontological resource review)

Geologic Deposit	Geologic Age	Type of Deposit/ Environment of Deposition	Fossil Resources	Paleo Potential	Area Present
alluvial sediments (including alluvium and colluvium)	latest Holocene (500-1,000,000 mya)[1]	unconsolidated silts, sands of valleys and plains, Terrestrial- fluvial.	none	low	widespread
Bridger Formation	middle Eocene--Bridgerian (37-58 mya)	tuffaceous sandstone and bentonitic mudstone, limestone. Terrestrial-fluvial, floodplain, accumulated after drying up of Lake Gosiute.	vertebrates, invertebrates, plants, trace fossils	high	widespread
Green River Formation Laney Shale Member	middle Eocene--Bridgerian (37-58 mya)	chiefly oil shale, lesser algal limestone, sandstone, claystone and tuff. Lacustrine, accumulated during renewed expansion of Lake Gosiute.	vertebrates, invertebrates trace fossils	high	T23 N, R111W

[1] mya = million years ago

3.2.6.4.1 Bridger Formation

Exposures of the Bridger Formation comprise most of the surface of the Refuge area along the Green River. The Bridger Formation interfingers with the Laney Member of the Green River Formation described below and is divided into an upper and lower unit by a tongue of that member. Deposits above the tongue comprise the Main Body of the Bridger Formation and those below comprise the Whiskey Butte Bed (Sullivan, 1980).

Fossil vertebrates have been collected from the Bridger Formation for more than 120 years (Leidy, 1869, 1871; Matthew, 1909; West, 1976; Gunnell and Bartels, 1994) and collections of these specimens are housed at nearly every major paleontology museum in the world.

Recent work in the Bridger Formation has been conducted in the Moxa Arch area and documented the presence of 43 genera of fossil mammals, 18 genera of reptiles, and at least 2 genera of fish (Bartels, 1991; Gunnell and Bartels, 1994).

The most common fossil animals found in the Bridger Formation include Lepisosteus (gar pike), Amia (bowfin), Echmatemys (emydid- turtle), Hybemys (emydid -turtle), Trionycid (soft-shelled -turtle) and the crocodilian taxa Diplocynodon and Crocodylus.

3.2.6.4.2 Green River Formation

The Green River Formation is represented in the Seedskadee NWR area by the Laney Shale Member of middle Eocene age. The Laney Member forms the top of the Green River Formation and records in its sediments the greatest expansion of ancient Lake Gosiute followed by its final restriction and desiccation. Lake Gosiute once occupied more than 75 percent of the Greater Green River Basin, or approximately 15,000 square miles (Roehler, 1992, 1993). In Seedskadee NWR, the Laney overlies the Wasatch Formation of early Eocene age and consists of tan and brown silty algal limestone and ostracodal marlstone.

Significant fossils have been found in the Green River Formation for over 150 years (Grande, 1984). The first fish fossil (herring) was discovered in 1856 by Dr. John Evans, near Green River, Wyoming. The herring fossil was named Knightia eoceaena, and is now Wyoming's State fossil. Since 1856 numerous fossil fishes, other vertebrates, insects, and plants have been discovered in this formation.

The Laney Member of the formation produces fossils from four major localities that occur over wide parts of the Green River Basin (Grande, 1984). Plant and insect fossils are very common. The mosquito, Culex sp., comprises more than 98 percent of the known fauna. Other invertebrates include ostracodes, mollusks, and gastropods. Common plant fossils include the remains of Plantanus sp. (Sycamore) and Equisetum (scouring rush) (MacGinitie, 1969). The remains of algal mounds or stromatolites occur elsewhere in the member.

The most common vertebrates found in the locality are fish in the herring genera Knightia and Gosiutichthys. Birds, salamanders, turtles, and crocodilians are rare. At least one complete articulated turtle and two crocodilian skeletons are known from this locality. The remains of small perching birds, primobucconids, occur as primarily feather impressions.

3.2.7 Public Use Facilities and Program Inventory

The current Refuge road system consists of 77 miles of designated roads within the Refuge boundary (Map 9). Twenty miles are classified as administrative roads and 57 miles are classified as open public roads. There are many two-tracks, trails, and roads created prior to the Refuge's establishment which are not official Refuge roads. Closed roads will eventually be restored by seeding with native vegetation.

One nine mile auto tour routes is located on the Refuge. This tour route is passable by passenger vehicles in the summer months, and often open in the winter. The 2.5 mile entrance road is an improved all-weather gravel road from State Highway 372 to the Refuge Headquarters.

All other designated roads are only seasonally passable and are not improved or maintained. Four-wheel drive and high-clearance vehicles are recommended. Seasonal closures are imposed. For the protection of habitat, vehicles are allowed only on established open roads and must be parked in designated locations (areas created for parking or signed as designated parking areas) or within 10 feet of the road.

3.2.7.1 General Public Use

The Refuge has 21 road access points (Map 8a & 8b). The numerous access points make it difficult to accurately estimate the number of visitors. An estimated 11,000 visits were made in 1996, up slightly from 1994 and 1995. Visits jumped to 15,000 in 1997. The increase was likely a reflection of visits associated with the 1997 Mormon Pioneer Trail Sesquicentennial celebration. Table 3.10 summarizes estimated visitor use from 1990 to 1997.

Table 3.10 Estimated Annual Visitors to Seedskadee NWR

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Total Estimated Visitors	3,757	4,264	5,12	6,009	8,327	10,355	12,017	15,000	13,000	15,500	16,500
Environmental Education**	107	214	762	1,045	642	605	592	700	762	850	400
Anglers	1,300	1,625	1,800	1,580	3,000	4,000	4,000	4,500	5,000	6,500	6,000
Hunters	450	700	850	1,525	1,185	1,250	1,925	2,500	5,000	6,500	5,000
Wildlife Observation	2,000	1,725	2,000	1,859	3,500	4,500	5,500	5,000	4,000	5,500	6,000

Note: Estimates are taken from Seedskadee NWR Annual Narrative Reports;
* Includes Mormon Trail Sesquicentennial; ** Includes on-site environmental education only.

An estimated 50 to 70 percent of the Refuge's visitors are from southwestern Wyoming. The remaining out-of-state visitors are comprised of three primary groups: those who are visiting wildlife refuges in the west ; those who are passing by the Refuge on their way to Yellowstone or Grand Teton National Parks; and anglers/hunters from Utah and Colorado.

A recent survey of visitors to Sweetwater County found that one of the most popular recreation activities was viewing wildlife (88.1 percent). Eighty-five percent of those surveyed had Sweetwater County as one of their destinations (Taylor, 1996).

The Refuge Headquarters is open Monday-Friday (7:30 am to 4:30 pm). Information and universally accessible rest rooms are available at the Refuge headquarters seven days a week during daylight hours.

The Refuge has a general brochure/leaflet which contains a Refuge map, describes facilities, and states general Refuge regulations. Brochures are available at the Refuge Headquarters, 14 primary Refuge road access points (Map 8a & 8b), the Farson Information Center, Wyoming Game and Fish in Green River, BLM in Rock Springs, and at the Chambers of Commerce(s) in Rock Springs and Green River.

3.2.8 Compatible Wildlife-Dependent Recreation

Seedskadee NWR offers visitors a wide variety of self-guided and dispersed recreation opportunities. The Refuge Improvement Act (1997) states that public use of a refuge may be allowed only where the use is "compatible" with the Refuge System mission and the purpose of the individual refuge (see Legal and Policy Guidance section). The Act also sets forth a current standard by which the Secretary of the Interior shall determine whether such uses are compatible. The term "compatible use" means a proposed or existing "wildlife-dependent recreational use" or any other use of a refuge, that in the sound professional judgement of the Service, will not materially interfere with or detract from, the fulfillment of the Refuge System's mission or the purpose of the refuge. Hunting, fishing, wildlife observation and photography, and environmental education and interpretation are the six priority general public uses of the National Wildlife Refuge System.

Before a new use is allowed on a refuge, the Service must determine that the use is compatible and not inconsistent with public safety. To determine if a new use is compatible, a refuge must estimate the time frame, location, and purpose of each use. Furthermore, the refuge staff must identify the direct and indirect impacts of each use on refuge resources and evaluate the use relative to the Refuge's purpose.

On lands added after 1996, the Service must identify, prior to acquisition, withdrawal, transfer, reclassification, or donation, which existing wildlife-dependent compatible recreational uses the Service will permit.

3.2.8.1 Wildlife Observation and Photography

Visitor estimates indicate that wildlife observation is the most popular public use on the Refuge (Table 3.10). Most wildlife observation activity occurs along the wildlife auto tour route and river corridor. The auto tour is on the west side of the River and passes by the Hawley wetland unit, Refuge headquarters, and Hamp wetland unit (Map 9). Much of the optimum wildlife watching opportunities occur in the River bottom, which is easily viewed from the auto tour route and many other open designated roads. Foot travel is permitted throughout the Refuge and affords exceptional opportunities for individuals wanting to hike and explore off-road areas (Map 8a & 8b).

3.2.8.2 Hunting

Hunting seasons usually occur between September 1 and mid-February. Hunting is permitted for select game species in accordance with State regulations. The most common species hunted are mule deer, pronghorn antelope, sage grouse, cottontail rabbit, ducks, and Canada geese. Other species which are open to hunting under State regulations include red fox, raccoon, white-tailed jackrabbit, coots, mourning doves, sora/Virginia rails, and snipe. A special hunt for moose occurs every 2 to 5 years to reduce populations and avoid habitat damage due to over browsing.

Certain areas are closed to hunting to protect Refuge facilities and to provide resting and feeding habitat for migratory birds (Map 6). Areas closed to hunting are clearly posted with signs. A voluntary avoidance program was instigated in 1997 to reduce hunter disturbance of wintering trumpeter swans. Hunters, as well as the non-hunting visiting public, are asked to stay at least 400 yards from swans. Winter is a critical time for swans which rely exclusively on food resources located in the open water (non-frozen) sections of the Green River to meet their energy demands. The River also provides a critical resting (loafing) area for winter waterfowl, especially swans. Less disturbance helps swans to reduce their overall energy demands.

3.2.8.3 Fishing

Fishing primarily focuses on four introduced cold water trout species (rainbow, brown, Snake River cutthroat, and Bonnieville cutthroat). Lake trout are occasionally caught during the winter/spring and kokanee salmon are occasionally caught in the fall. Approximately half of the Refuge (north boundary of Refuge to the Green River and Big Sandy confluence) is a special regulations fishing area (Map 6). Only one fish over 20 inches may be taken and fishing is restricted to artificial lures and flies. The Green River within the Refuge is designated as a Red Ribbon trout stream, which means it supports a trout standing crop of between 500 and 900 pounds per mile. Fishing is the second most popular public use at Seedskadee. Fishing on the Refuge is subject to State regulations. The Wyoming Game and Fish Department manages the fishery with assistance from the Refuge staff.

3.2.8.4 Non-Motorized Boating

More than 99 percent of all Refuge boating use is non-motorized. The lack of motorized boats provides solitude and excellent angling and wildlife viewing opportunities. Four improved boat ramps have been developed and are spaced to provide easy one day float trips.

3.2.8.5 Commercial Guiding

Commercial fishing guides started to guide clients on the Refuge before 1990. To comply with Refuge regulations, this activity was regulated via an annual permit system which was initiated in 1996. Eleven permits were issued in 1996. Commercial guides are charged fees to utilize the Refuge and are also required to meet strict Refuge regulations regarding the number of boats and anglers occurring in various River sections.

In 1997, the Service, BLM, Reclamation, and Forest Service agreed to issue a single commercial permit for the Green River stretch starting at Fontenelle Dam and ending at the beginning of Flaming Gorge Reservoir (Fire Hole). This joint permit for commercial guiding was discontinued after 1997 and is currently under review to determine its feasibility. A new Refuge draft commercial guide plan was developed and implemented in 2000. The new plan will eventually reduce (via attrition) the total number of permitted commercial outfitters to a maximum of four. Currently six commercial outfitters are permitted on the Refuge.

3.2.8.6 Environmental Education/Outreach

Environmental education is usually conducted while touring the Refuge with school, scout, and civic groups. Demand for these tours continues to increase. In 2001, over 680 people participated in tours that were provided to 16 different groups.

Since 1993, the Refuge, in cooperation with Trout Unlimited , Highland Desert Flies, and the Wyoming Game and Fish Department, has sponsored "Take A Kid Fishing Day." A local pond is stocked at the Rock Springs Fairgrounds with catchable trout, and refreshments are served. This event has attracted up to 300 people from local communities. The event provides an opportunity to inform young people and their parents about wildlife and the Refuge.

Seedskadee NWR partners with the Wyoming Game and Fish and the Bureau of Land Management Green River Resource Area in providing seasonal wildlife updates for media outreach programs. In addition, Seedskadee NWR conducts special programs for International Migratory Bird Day and National Wildlife Refuge Week.

3.2.8.7 Interpretation

Four interpretive areas occur on Seedskadee NWR: Lombard Ferry, Wetlands Overlook, Headquarters Kiosk, and Headquarters visitor area (Map 8a & 8b). Current interpretive signs are limited to these areas. The Refuge Headquarters contains indoor space dedicated to interpretive exhibits. Interior exhibits include a wall-mounted map, a touch table, a children's board, three dimensional models of primitive cultures, and several bird and mammal mounts.

Currently, four Refuge brochures are published (General Information and Travel Map, Hunting and Fishing, Historical, and Wildlife Observation). The general Information brochure describes basic regulations and provides suggestions for enjoying the Refuge. The brochure "Seedskadee National Wildlife Refuge and Vicinity: A Historical Perspective" describes 14 of the historic sites existing on the Refuge, including numerous homesteads, trading posts, and ferry crossings.

Refuge staff conduct public outreach efforts by hosting display booths at the Green River Fly Swap, Casper Hunting and Fishing Expo, and Red Desert Sport Show.

3.2.9 Non Wildlife-Dependent Recreation

The Refuge staff is concerned with the non wildlife-dependent recreation activities occurring at the Refuge. These activities are a concern to management because they are unauthorized, conflict with Service policy, and create significant wildlife and habitat disturbance. These non wildlife-dependent recreational activities include, but are not limited to,: camping, swimming and power boating, off-road vehicle use, etc.

3.2.9.1 Camping

It is Service policy that, "Camping will not be permitted when any other practical alternative is available and only when required to implement a planned and approved wildlife-wildlands oriented recreational activity (8 RM 9.5)." Camping is not necessary to enjoy the wildlife and fish resources on the Refuge. Practical alternatives are offered at the Bureau of Land Management operated campgrounds located just upstream from the Refuge (Slate Creek, Tailrace, and Weeping Rock). The Bureau of Land Management allows short-term (14 day) dispersed camping on lands which surround the Refuge.

No authorized general public overnight camping opportunities are provided on the Refuge. Currently, camping occurs on a limited permit basis for scout troops performing civic projects for Seedskadee NWR.

3.2.9.2 Swimming and Power Boating

Swimming and power boating on the Green River are not encouraged at Seedskadee. Opportunities exist for such recreational activities above and below the Refuge at Fontenelle and Flaming Gorge Reservoir, and downstream of the Refuge on the Green River.

3.2.9.3 Off-Road Vehicles

Off-road vehicle use is prohibited in any area which is not an established and designated roadway for public travel within the Refuge. Designated Refuge roads are shown in the Refuge General brochure. Non-designated two-track "roads" crisscross areas and result in habitat degradation. Eventually, all non-designated roads will be closed and restored by seeding with native vegetation. The number of roads are limited on the Refuge to protect wildlife habitat, reduce disturbance to wildlife, protect the beautiful views, and enhance the overall visitor experience.

3.2.10 Administrative Support

3.2.10.1 Current Facilities

Refuge buildings include:

- Headquarters building consisting of a small visitor information center, four offices and a conference room
- Maintenance shop
- Two equipment storage buildings
- Three older 3-bedroom homes (refuge staff residences)
- One 3-bedroom bunkhouse for multiple-occupancy of seasonal staff and volunteers
- One cold storage building located at the Hay Farm

The maintenance shop and storage facilities are relatively new and will meet the Refuge needs for the immediate future. Inadequate housing, however, could limit the capacity for the increasing Refuge's volunteer workforce. Demand currently exceeds supply in the summer months. Office space is at a premium and may need to be expanded if staffing increases.

The Refuge also has the following recreational facilities to orient visitors and provide for public use: 4 primitive boat launches; 24 walk-over and walk-through structures along the Refuge's perimeter fence; nine-mile mile auto tour road; one wetland interpretive overlook; the Lombard Ferry Historic Site (interpretive); 14 information sites; and an orientation kiosk at Refuge headquarters. Universally accessible restrooms are available at the Refuge headquarters (Maps 8a & 8b)

3.2.10.2 Current Staffing

Seedskadee NWR staffing has always been limited, but has fluctuated significantly in the last six years. In 1993, the Refuge had a permanent staff of five full-time positions, including a refuge manager, a refuge operations specialist, two maintenance workers, and a biological technician/clerk. In 1994, the permanent staff was reduced by 1 full-time equivalency (FTE), and in 1995 the permanent staff was further reduced to 3 FTE's. Since 1995, various FTE's have been restored. Current (2000) staffing includes six permanent positions (Table 3.11).

Table 3.11 Current Personnel (2000)

FTE	Current Position
1	Refuge Manager/Project Leader, GS 12
1	Assistant Refuge Manager (ROS), GS 11
1	Administrative Support Assistant, GS 6
1	Biologist GS 9/11
1	Engineering Equipment Operator, WG 9
1	Biological Technician, GS 6
6	Total Current FTE

The Seedskadee staff also manages Cokeville Meadows NWR, currently about 8,000 acres, located two hours west near Cokeville, Wyoming. A CCP will be prepared for Cokeville Meadows NWR under separate cover.

3.3 Special Management Areas

3.3.1 Special Legislated Designations

No wilderness areas currently exist or are proposed for Seedskadee NWR. The Service has not pursed any formal review of Seedskadee lands for designation as wilderness. Portions of the Refuge may qualify for designation. Future Service policy may require the formal review of all lands within the Refuge System. A draft of the Service "Wilderness Stewardship Policy" is currently in review. Within the Rock Springs District of the Bureau of Land Management, a total of four wilderness areas and eight wilderness study areas have been proposed. The closest of these is 50 miles from the Refuge boundary.

The Refuge contains an abundance of historical/cultural resource sites and has four National Historic Trails which traverse through it (Map 7). Several historic sites and trail segments have been included in the National Register of Historic Places. The general Refuge setting provides landscape views which look much like they did in the early 19th century. Maintaining the current landscapes of the Refuge and surrounding area are important to maintaining the natural and historic nature of the area.

The American Bird Conservancy (ABC) has designated Seedskadee NWR, and the surrounding BLM lands, as a Globally Important Bird Area (IBA). To qualify for this designation an area must have significant ongoing efforts to conserve wild birds and their habitats. ABC's IBA program, supported in part by The Nature Conservancy and the Disney Wildlife Conservation Fund, aims to identify and protect a network of key sites to further bird conservation efforts.

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^2, 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.*

Seedskadee 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 then 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 withing 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 exclosures.
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 shorebirds 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, Sagebrush, 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. Drawdowns, 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 then 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 to10 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 Fontennelle 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 over-crowding.
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:

Seedskadee 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^2) at Seedskadee 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 he lands from RSGA to the Refuge.

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 interagency 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.

V. Implementation and Monitoring

5.1 Funding and Personnel

Staffing Needed to Implement This Plan: Table 5.1 shows current staff and proposed additional staffing needed to fully implement this plan. If all positions were filled, the Refuge would be able to carry out all aspects of this plan to a reasonable standard. If some positions are not filled, completion of some projects may be delayed or not completed. Staffing and funding are expected to come over the 15-year life of this Plan. Seedskadee NWR is currently responsible for management of Cokeville Meadows NWR (7,677 acres) which remains an unfunded Refuge.

Table 5.1 Staffing Plan

Current Personnel	Personnel Needed
Refuge Manager (Project Leader) GS-12	Refuge Manager (Project Leader) GS-12
Assistant Refuge Manager (ROS) GS-11	Assistant Refuge Manager GS-11
Administrative Support Assistant GS-06	Administrative Assistant GS-07
Ecologist GS-06	Ecologist GS-11
Biological Technician (Wildlife) GS-06	Biological Technician (Wildlife) GS-07
Engineering Equipment Operator WG-09	Engineering Equipment Operator WG-10
New Position	Public Use Specialist GS-09/11
New Position	Maintenance Mechanic WG-09
New Position	Biological Technician GS-5 (Seasonal)

Funding Needed to Implement This Plan: Currently, a large backlog of maintenance needs exists on the Refuge. The needs are recorded in a national Maintenance Management System (MMS). In 2000, under current management plans, the backlog for Seedskadee NWR was $2,271,000. These needs would need to be met under this plan. A summary of these needs is listed below.

Vehicles and Equipment	$1,428,000
Water Control Structures and Dikes	$ 335,000
Domestic Water System	$ 375,000
Bridges and Roads	$ 25,000
Buildings	$ 90,000
Radio System	$ 18,000
TOTAL	$2,271,000

The System also uses another database, the Refuge Operating Needs System (RONS). Table 5.2 reflects the Service's (Refuge's) proposed projects, in priority order, as detailed in the Refuge Operational Needs System (RONS). Many of these "projects" involve increases to the Refuge's permanent staffing and funding to carry out the increased responsibilities outlined in this CCP. They also represent needs stemming from an increase in acquired acreage and the maintenance of additional facilities. Each year RONS projects are submitted and compete with similar projects within the Region and with other Service Regions for Refuge funding increases. Completed RONS data sheets for the proposed projects can be found in Appendix C of this document.

Table 5.2 RONS Project Summary for Seedskadee NWR (2000)

Project Description (in priority order)	Base Increase (B) # of Year Funds (1-4) Hire Personnel (P)	Projected Cost
Enhance Public Education and Outreach Activities	B/P	$139,000
Control and Eradicate Noxious Weeds	B/P	$78,000
Maintain Public Use and Refuge Facilities	B/P	$125,000
Improve Water Level Management to Enhance Wetland Impoundments	1	$49,000
Improve Trumpeter Swan Management and Augmentation Program	1-2	$38,000
Improve Directional and Interpretive Signing To Enhance Visitor Experience and Protect Habitat	1	$36,000
Enhance Refuge Brochures and Public Information	1	$29,000
Enhance Volunteer and Temporary Hire Housing Facility	1	$65,000
Implement Riparian Restoration Efforts	B	$54,000
Provide Education Outreach Displays and Protect Historic Trails	1	$40,000
TOTAL		$653,000

Table 5.3 outlines projects which the Service and Reclamation agree to carry out jointly as part of Reclamation's mitigation obligations for the Seedskadee Project. Funding is generally available for this mitigation work and it is anticipated that these projects will be completed on or about the schedule proposed below. None of these "projects" represent increases to the Refuge's base funding.

Table 5.3 Reclamation Cooperative Mitigation Projects	
Project Description	Work Schedule (FY)
Habitat Development Projects	
Enhance Pal Unit Wetlands	2001-2002
Restore Oxbow/Other Wetlands	2002-2003
Enhance Dikes and Water Control in Hawley Unit	2002-2003
Control Pepperweed/Restore Infested Areas	1999-2010
Restore Riparian Areas	1999-2010*
Rip, Seed and Restore Non-designated Roads	2000-2004
Reclaim Gravel Barrow Pit	2002
Enhance Volunteer Housing by Adding Air Conditioning, Propane Heat, Mudroom, and Screen Porch	2002
Public Use Projects	
Construct Boat Ramps and Parking	1999-2002
Improve Access and Auto Tour Route, Upgrade Road System to All-Weather	Completed
Design and Install Interpretive Signs Along Auto Tour Route	2003-2004
Construct a Lombard Interpretive Trail	2001
Construct Interpretive Trail Near Headquarters	2002-2003
Revise and Reprint Refuge Brochures	1999-2003
Construct Environmental Education Facility	2001-2003
Construct Accessible Restroom and Associated Parking Lot Facility at Upper Dodge Bottoms Boat Ramp	2002
Finish Fencing of "Roundout" Parcels Transferred From Reclamation in 19997/78	2003
Install Gates at Administrative Roads Throughout the Refuge to Reduce Off-Road Travel	2002
Cultural Resource Inventory; Document Historic sites	Complete

* (Reclamation funding through 2003 - work likely to extend well beyond 2003)

5.2 CCP Implementation and Step-down Management Plans

The 1987 Refuge Master Plan, 1989 Station Plan, and 1995 Refuge Development Plan will be replaced by this Comprehensive Conservation Plan (Table 5.4). The CCP describes Refuge management and priorities for the next 15 years and details Refuge development (infrastructure, habitat, and public use) projects, both by the Service and by Reclamation under their mitigation obligation. This CCP is intended as a broad umbrella plan that provides general concepts, specific wildlife and habitat objectives, and federally listed species, public use, and partnership objectives. Depending on the Refuge needs, these may be very detailed or quite broad. The purpose of step-down management plans is to provide greater detail to managers to implement specific actions authorized by the CCP. Step-down management planning is the formulation of detailed plans that describe management activities necessary to implement strategies identified in this CCP. Step-down management plans describe the specific management actions to be followed, "stepping down" from the general goals, objectives, and strategies.

Table 5.4 Management Plan Status

Plan	Date Last Revised	Action	Revise
Refuge Master Plan (Development Plan 1987)	7/87	Replaced by the CCP	2001
Station Plan (with goals and objectives)	8/89	Replaced by the CCP	2001
Refuge Development Plan	12/95	Replaced by the CCP	2001

Table 5.5 displays a list of step-down plans and a schedule for their revision. Following completion of the CCP, most plans will need to be reviewed and revised, as necessary, to comply with the CCP and new policies following the passage of the Refuge Improvement Act of 1997. Additionally, several new plans, including the Public Use Plan and the Habitat Management Plan, will be developed. The preparation of new step-down plans or substantial changes to existing step-down plans typically will require further compliance with the National Environmental Policy Act (NEPA), other policies, and opportunity for public review.

The Habitat Management Plan is a new plan that will address management of all habitat types on the Refuge. It will include a discussion of habitat management objectives and various treatments (tools) to be used in habitat management and incorporate several existing step-down plans which deal with habitat management. The Public Use Plan will address the appropriate types and level of public use to be allowed on the Refuge, program management, such as hunting, and the development of facilities to accommodate public use.

Table 5.5 Status of Step-down Plans

Step-down Plan	Date Last Revised	Objective	Revise
Beaver Trapping Plan	3/81	Review and incorporate into Habitat Plan	2004
Cultural Resource Plan	New	Complete	2004
Fire Management Plan	5/83	Review and revise	2002
Fishing Plan with Commercial Guide Sub-Plan	3/81	Review and revise	2002
Grassland Management Plan	5/82	Review and incorporate into Habitat Management Plan	2004
Habitat Management Plan	New	Complete	2004
Hunting Plan	8/86 1990 amended	Review and revise	2002
Integrated Pest Management Plan	1/98	Review and incorporate into Habitat Management Plan	2003
Predator/Furbearer Management Plan	4/91	Review and revise	2002
Public Use/ Sign Plan	New	Complete	2002
Safety Plan	7/98	Review	2001
Water Management Plan	1/98	Review and incorporate into Habitat Management Plan	2004
Wildlife Inventory Plan	8/91	Review and revise	2004
Commercial Guide Plan	NEW	Draft Complete 2000	2001

5.3 Partnership Opportunities

Only with public support will the Service succeed in its mission. That support comes through outreach: fostering education, understanding, and communicating the importance of the Service commitment to protecting habitat upon which wildlife depends. Outreach includes a broad array of activities and services focused on building relationships and communication. The Service is committed to getting its message to both traditional and nontraditional groups.

Seedskadee NWR will continue to actively seek out and foster partnerships with organizations and individuals with whom a common goal is shared. Many individuals, groups, and organizations have contributed in significant ways to the Refuge. Local Scout Troops have assisted with many fencing and other maintenance projects. Ducks Unlimited has assisted with construction, placement, and maintenance of nesting structures. Trout Unlimited has helped the Refuge sponsor "Take a Kid Fishing" day and assisted with planning for numerous instream fish habitat structures on lands upstream off-Refuge. Individual volunteers have completed habitat and biological surveys, constructed brochure boxes, graded roads, repaired fence, entered data into computers, completed environmental education programs, conducted general maintenance, completed numerous wood working projects, etc.

The WYG&F has been a partner with the Refuge by coordinating management of game species and fisheries on the Refuge, distributing information to the public about the Refuge, and providing cost share and technical assistance on habitat projects. The Bureau of Reclamation has provided extensive financial and technical assistance for completion of Refuge projects. Many individuals with an interest in the Refuge have provided thoughts and ideas for habitat projects, have assisted with cleanup of trash, and provided the Refuge information to enhance law enforcement efforts.

Seedskadee NWR has partnered with the Bureau of Reclamation, the Bureau of Land Management, the Forest Service, the Natural Resource Conservation Service, the Wyoming Game and Fish Department, and private individuals to produce The Green River and Bear River Focus Area Plans of the Intermountain West Joint Venture. This plan supports projects that benefit wetland and riparian habitats. The Partners for Fish and Wildlife Program is another example. Through this program, Seedskadee NWR provides technical assistance to private landowners interested in improving habitat on their property.

The American Bird Conservancy (ABC) recently partnered with Seedskadee NWR to designate the Refuge as a "Globally Important Bird Area (IBA). The Refuge's designation as a IBA will assist ABC in developing a network of key sites in the U.S. and globally to further national and global bird conservation efforts. The Refuge will benefit through national attention as a valuable bird area, increased visitor support, and potentially increased funding.

The Big Sandy Working Group is a group of land managers and private individuals interested in improving riparian and upland habitat along the Big Sandy River. The Big Sandy watershed, upstream of the Refuge, has a direct impact on the success of Refuge projects to restore habitat. The Refuge has also partnered with the Bureau of Land Management, U.S. Forest Service, and Bureau of Reclamation to cooperatively manage recreation resources along the lower section of the Green River in Wyoming. These partnerships benefit wildlife and fisheries and their habitats in the Green River Basin.

Many new partnership opportunities await Seedskadee NWR. The Partners in Flight program strives to "improve our understanding of neotropical migrants, identify species most at risk, and develop and carry out cooperative plans to protect their habitat." This partnership is a natural area of emphasis for Seedskadee with its important riparian habitats. While the Refuge participates in this program to some extent, a more active role in the future is anticipated.

Additionally, the Refuge staff needs to spend more time on outreach. The staff has, and will continue to communicate and work with local ranchers, congressional staffs, State and local governments, local businesses in Green River, Rock Springs and Farson, area schools, and universities and colleges (particularly in Wyoming). More outreach in the local communities is needed to understand the concerns of local citizens and to help them understand the mission, goals and objectives of Seedskadee NWR. An environmental education center, constructed by the Service and Reclamation could provide a place for area schools to conduct year-round environmental education as well as a center for forums with the local communities on issues affecting wildlife and the environment in southwestern Wyoming. It would be advantageous for the Refuge to explore the development of a "Friends" group or other community support organization to assist the Refuge in carrying out its goals and objectives. The Environmental Education center could provide the catalyst for such a group.

5.4 Monitoring and Evaluation

This CCP is designed to be effective for a 15-year period. The plan will be reviewed annually and revised as required to ensure that established goals and objectives are still applicable and that the CCP is implemented as scheduled. The monitoring program will focus on issues involving public use activities, habitat management programs, wildlife inventory, monitoring and management activities, and the progress and success of Refuge development as part of Reclamation's mitigation efforts. Monitoring and evaluation will utilize the adaptive management process which includes goal and objective setting, applying management tools and strategies, and monitoring and feedback to validate objectives. Adaptive management provides a framework within which biological measures can be evaluated by comparing the results of management, to results expected from objectives.

Where information gaps exist, a concerted effort will be made to obtain information. With new information, goals and objectives may need modification. Public involvement will be encouraged during the evaluation process.

Monitoring of public use programs will involve the continued collection of visitor use statistics. Monitoring will be done to evaluate the effects of public use on Refuge habitat, wildlife, and refuge visitor experience. In particular, river use will be closely monitored to assess success and satisfaction with river use levels and commercial use of the river by permitted outfitters.

Collection of baseline data on all wildlife populations will continue. This data will be used to update existing species lists, wildlife habitat requirements, and seasonal use patterns. Neotropical migratory birds, raptors, and species of management concern will be the focus of monitoring efforts. Wildlife monitoring will be used to evaluate the effects of public use and habitat management programs on wildlife populations. Additionally, a series of vegetative transects/plots in all major habitat will be established as a long-term habitat monitoring network. This information will be used to assess the effects of abiotic factors (weather), habitat manipulation (such as burning and invasive species control), and wildlife population management strategies (hunting, trapping, etc.) on long-term habitat trends on the Refuge.

This CCP outlines the development actions needed to complete Reclamation mitigation efforts on Seedskadee National Wildlife Refuge under the Seedskadee Project (Section 8, CRSP) and, as such, supersedes the 1958 "Coordination Act Report" for Seedskadee NWR. A list of projects, with expected start and completion dates, responsibilities, and estimated budgets, will be reviewed and revised annually by the Service and Reclamation. Most activities, particularly in the area of infrastructure and public use development, are detailed in this CCP. Some actions necessary for habitat mitigation (i.e., riparian restoration) are still in the developmental stages and therefore specific mitigation actions are not included here but will be part of later specific action plans (i.e., riparian restoration plan). The Service will provide an annual progress report to Reclamation. The success of mitigation efforts in meeting goals and objectives, outlined in this CCP, will also be addressed.

5.5 Plan Amendment and Revision

The Seedskadee National Wildlife Refuge CCP is a dynamic plan. While it will serve as a guide for overall Refuge direction, it will be adjusted to consider new and better information, ensuring that Refuge activities best serve the established purpose of this Refuge and the mission of the National Wildlife Refuge System. The CCP will be reviewed every five years, and monitored continuously to ensure the developed management actions support the goals and objectives of Seedskadee NWR.

This CCP will be informally reviewed by Refuge staff while preparing annual work plans and updating the Refuge Information Management System (RMIS) database. It may also be reviewed during routine inspections or programmatic evaluations. Results of the reviews may indicate a need to modify the CCP. The monitoring of objectives is an integral part of the plan, and management activities may be modified if desired results are not achieved. If minor changes are required, the level of public involvement and associated NEPA documentation will be determined by the project leader. This CCP will be formally revised at least every 15 years.

Seedskadee National Wildlife Refuge

Environmental Assessment

September 2001

Environmental Assessment

Tables

Chapter 1. Purpose, Need, and Issues

The purpose of this Environmental Assessment is to publicly disclose the possible environmental consequences that implementation of the Seedskadee NWR CCP could have on the quality of the physical, biological, and human environment as required by the National Environmental Policy Act of 1969. This assessment analyzes three levels of management intensity on Seedskadee NWR. The Preferred Alternative, the CCP, is an intensive habitat and wildlife management program alternative designed to incorporate science-based management practices and monitoring. The Preferred Alternative also emphasizes development of education, interpretation, and outreach opportunities. The No Action, or current management, alternative is science-based but narrower in scope than the CCP. The third Alternative maximizes wildlife benefits by focusing on habitat protection and describes a reduced public use approach.

The U.S. Fish and Wildlife Service (Service) recognized the need for strategic planning for all the components of its Refuge System, and in September 1996, Executive Order 12996 was enacted which gave the Refuge System guidance on issues of compatibility and public uses of its land. Later on, Congress passed the National Wildlife Refuge System Improvement Act in October 1997, which, for the first time in the Refuge System's history, required that Comprehensive Conservation Plans (CCP) be prepared for all refuges within 15 years. The CCP should describe how lands and wildlife will be managed, monitored, and evaluated to determine if the desired habitat and wildlife responses occur. The CCP must also address which wildlife-dependent recreation and visitor opportunities are compatible and appropriate. The planning process also provides opportunities for the public and State and Federal agencies to provide input.

The CCP is intended to provide long-range guidance for the management of Seedskadee NWR based on careful consideration of the physical and biological characteristics of the land base. It is designed to further achieve the U.S. Fish and Wildlife Service and National Wildlife Refuge System missions and Seedskadee's goals and objectives which emphasize the protection and enhancement of wildlife and their habitats. Refer to Chapters 1, 2, and 3 of the CCP for background information, a description of the planning process and a description of Refuge resources.

Chapter 2. Management Alternatives

Several alternatives were considered when developing the EA. One of the alternatives that was discussed but was eliminated from the detailed analysis is discussed below.

Maximized Public Use Alternative
This alternative would have developed the Refuge as a recreational area. All areas would have been opened to the public and many new facilities would have been built. Development might include multiple hiking trails, parking lots, two additional boat ramps, campgrounds, and a fishing pond facility. This alternative was not analyzed in detail because it conflicts with the Refuge purpose of serving as a refuge and breeding ground for migratory birds and other wildlife and the intent of the National Wildlife Refuge System Improvement Act, putting wildlife first.

Alternative 1 Current Management Continues (No Action)

Under the No Action Alternative, the current management direction would continue. The emphasis is on management of existing wetlands and additional wetland creation and enhancement. Wetlands are managed primarily to provide shallow wetland habitat for migratory birds (waterfowl, shorebirds, and wading birds) and more permanent water for waterfowl production. To the extent other Refuge resources are available, riparian and upland wildlife habitats are protected and managed to benefit native and migratory species. Minimal monitoring of migratory and resident wildlife populations occurs. No habitat monitoring or monitoring of management activities occurs with the exception of the efficacy of weed control efforts.

Public use opportunities are focused on wildlife-dependent public uses. Facilities are few and largely primitive. Accessible restrooms are located at Refuge headquarters. Travel is restricted to existing designated roads. Most roads are primitive and infrequently maintained. An auto-tour route exists near the Headquarters. There are no developed interpretive trails. Interpretive panels are located at Refuge headquarters and one is located at the Hawley overlook. Simple brochures provide information on the Refuge, regulations, hunting and fishing, the area history, and watchable wildlife.

Alternative 1 A. Wildlife

Alternative 1 A1. Goal: Threatened and Endangered Species

To restore, enhance, or protect threatened and endangered flora and fauna that currently occur or have historically occurred in the area of Seedskadee NWR.

1. Management for threatened and endangered, candidate, and species of special concern consists primarily of habitat protection, protection of individuals from disturbance, providing adequate food resources and some population monitoring. Populations of bald eagles are the only federally-threatened species using the Refuge which are monitored each year. Observations of any special status species are recorded in the Refuge database. When necessary, special regulations and closures are instituted for protection of wildlife species and their habitat on the Refuge.

Alternative 1 A2. Goal: Wildlife

Preserve, restore, and enhance the ecological diversity and abundance of migratory and resident wildlife with emphasis on native species.

1. Management of trumpeter swans consists primarily of managing the Hawley wetland unit to provide nesting habitat, protection of individuals from disturbance, providing adequate food resources and some population monitoring. The Refuge cooperates with WYG&F in the reestablishment of the Rocky Mountain Population of trumpeter swans.
2. Management of moose and mule deer populations consists of setting harvest objectives in conjunction with the WYG&F. There is no monitoring of grazing impacts to habitats. WYG&F conducts aerial surveys to estimate populations.
3. Management of sage grouse consists primarily of protection of habitat from domestic livestock grazing and off-road vehicle travel. There is no population monitoring or evaluation of habitat conditions.
4. Management of habitat for migratory birds consists of maintaining and enhancing existing managed wetlands, and the protection of riparian, upland and riverine habitats. Waterfowl surveys are conducted bi-weekly in the fall. Waterfowl nest production is monitored every 3 to 5 years.
5. Management for other indigenous wildlife species consists of protection and enhancement of existing habitats. Predators and furbearers are managed to reduce these species impacts to riparian vegetation and ground-nesting birds.
6. When necessary, special regulations and closures are instituted for protection of wildlife species and their habitat on the Refuge.

Alternative 1B. Habitat

Alternative 1 B1. Goal: Riparian

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.

1. Approximately 40 cottonwood groves occur on terraces along the Green River and another 15 or so on islands. A riparian restoration pilot project was conducted to determine potential success of restoration and enhancement of woody riparian species and management prescriptions. Restoration includes an emphasis on woody species planting. Planting of understory woody shrubs may occur in up to nine randomly selected sites based upon the results of the pilot project. Riparian restoration research will continue through 2002 and recommendations to protect and restore this habitat will be available in 2003.
2. No monitoring wells are installed to determine the groundwater levels.
3. The flow regime for the Green River through the Refuge is managed by Reclamation for its project purposes and consistent with downstream water rights and commitments.
4. Monitoring of the impacts of browsing by native wildlife is not conducted. Control of native wildlife that browse on woody plants (deer and moose) is coordinated with WYG&F with the objective of providing hunting opportunities and to reduce over browsing. A special hunt for mule deer occurs outside the regular season to reduce their numbers. Beaver activity is monitored annually and plant barriers and trapping are used to deter browsing. Livestock grazing is not allowed or used in riparian areas. Livestock removal is conducted on an as-needed basis. Surveys of the boundary fences are conducted about two times per year or as time and staff permit.
5. Prescribed fire has been used in the past in an attempt to rejuvenate decadent willows in the riparian area. Present management uses fire infrequently to manage invasive species.
6. Monitoring data were collected for three years on avian productivity and survivorship in riparian forest habitats. There is no regular ongoing monitoring program specific to riparian forest communities and their habitats.

Alternative 1 B2. Goal: Wetland

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

1. Three oxbow wetlands have been restored in the McCullen Bluff, Hamp, and Hawley Units through diversions into side channels. Wetlands have been created and enhanced through development of impoundments (dikes and water control structures) in the Hamp, Hawley, Lower Hawley, and Dunkle Units. Further mitigation for loss of wetland emphasizes restoring historical, enhancing existing, and creating new wetlands. One additional managed wetland complex would be developed in the Pal Management Unit.
2. One additional rock sill would be installed to divert water from the Green River into historic side channels and restore associated wetland habitat. Natural topography would be used to minimize soil disturbance and alterations to natural features.
3. Existing wetlands units (Hamp, Hawley, and Dunkle) are managed to provide migratory and breeding habitat for waterfowl, shorebirds, and wading birds. A Water Management Plan is applied and modified as necessary to provide shallow wetland habitats for spring and fall migration and deeper wetland habitats for breeding and brood-rearing areas.
4. Predators and beaver are controlled under the direction of an approved Predator Management Plan. Management trapping by Refuge staff occurs in the Hawley and Dunkle units for mammalian nest predators during waterfowl nesting season. Beaver are removed when significant damage occurs to cottonwoods or water management infrastructure. Animals are live-trapped where possible. Some trapping permits are issued for management purposes.
5. Little monitoring of wildlife use occurs. Waterfowl production monitoring occurs every 3 to 5 years. No vegetative monitoring occurs.

Alternative 1 B3. Goal: Uplands

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.

1. Upland areas are fenced, but not intensively managed. Grazing and prescribed fire have not been used as a management tool. No monitoring occurs in the upland habitats.

Alternative 1 B4. Goal: Riverine

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.

1. No significant native fishery exists in this section of the Green River. Management of the cold-water (sport) fishery is generally left up to the WYG&F. The Refuge occasionally assists with habitat improvements for fisheries. No opportunities exist to restore endangered Colorado River fishes in this stretch of the Green River due to the presence downstream of Flaming Gorge dam and lack of suitable habitat.

Alternative 1 B5. Goal: Invasive Species

Restore and maintain indigenous flora diversity by controlling the invasion of exotic plant species on the Refuge.

1. The weed control efforts are targeted to small, spreading infestations and to preventing existing large populations from seeding. Pepperweed has been aggressively treated starting at the north boundary of the Refuge and working south. An integrated approach is used (the Refuge's Draft Integrated Pest Management Plan); however, chemical control is generally the only effective method available for many species. Some biological control agents have been released on the Refuge. The University of Wyoming is currently researching long-term sustainable methods to remove pepperweed from Refuge lands.

Alternative 1 C. Public Use , Recreation, and Resource Protection

Alternative 1 C1. Goal: Wildlife-Dependent Recreation

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.

1. A comprehensive wildlife observation guide is available to assist the visitor. Using the existing road system, Seedskadee NWR provides a 9-mile-long seasonal wildlife auto-tour route. Several pullouts have been developed but do not have interpretive signs. An overlook with interpretive signs is provided at the developed Hawley wetland unit near Refuge headquarters.
2. The Headquarters public rest room is universally accessible. Accessibility would be a high priority in developing new facilities and public use opportunities.
3. All vehicle travel, including bicycles, are restricted to existing designated roads. All-terrain-vehicles and vehicles not licensed for highway driving are not permitted on the Refuge. Vehicle access through fences is provided by cattle guards and is limited to existing designated roads. Seventy-seven miles of designated roads are open to public travel (Map 9). Two-track spur roads are closed to protect resources. Closed two-tracks are allowed to naturally revegetate. Parking is informal along existing designated roads and occurs haphazardly.
4. All areas are open to foot travel. Cross-over structures are provided for foot access across Refuge fence.
5. Seedskadee NWR partners with WYG&F to manage hunting. The Refuge hunting plan was completed in 1986 and is updated annually. Hunting is allowed except in two areas. The administration area around the houses and office is closed to all regular hunting. The Dunkle and Sagebrush managed wetland units are closed to waterfowl hunting. The entire River is open to hunting. Only portable blinds or blinds constructed from dead, downed wood may be used. Cutting of standing live or dead vegetation or digging pit blinds are prohibited. Portable blinds, tree stands, and decoys must be removed daily.
6. The Green River is managed by the WYG&F as a trophy trout fishery from the CCC bridge downstream to the confluence of the Big Sandy, and State regulations apply. Boating is allowed on the River through the Refuge. Most use is by non-motorized watercraft. The Refuge provides four boat launch sites and associated parking areas. Recreational fishing is unlimited.
7. “Take A Kid Fishing Day” is one of the principal outreach activities for the Refuge.

8. Commercially guided floats are allowed from the north boundary to the 6 Mile Hill boat ramp (just south of Big Sandy confluence) through issuance of fee permits. Fee permits are issued on an annual basis only. Through attrition, the Service will reduce the number of permits to 4 or less. The season is from April 1 to October 30 of each year. The number of boats per day/outfitter and the number of boats per day/section of River is limited. Daily use is first-come, first-serve and coordinated via a telephone answering service; and use can be provided for both fishing and scenic tours. Use data are required from permitted guides; however, formal monitoring of recreational use is not conducted by the Refuge.
9. The Refuge is closed after dark. No camping is provided on the Refuge. Visitors are directed to overnight facilities located outside the boundary of the Refuge.
10. Visitor use levels are low and not limited except for commercial use on the Green River which has been set at a low level.

Alternative 1 C2. Goal: Environmental Education and Interpretation

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.

1. Current interpretive resources include: historical and biological interpretive exhibits at the headquarters, a portable exhibit for interpretive outreach, an information kiosk near headquarters, and two interpretive signs at the Hawley Wetland Overlook ("Waterfowl in a Dry Land" and "Cattails and Sagebrush"). In addition to these, two interpretive panels are located inside the Refuge headquarters (i.e., "Welcome To Seedskadee" and "Kids Corner").
2. No interpretive trails exist on the Refuge.
3. Upon request, the Refuge staff provides tours to schools, civic groups, and other organizations. The Refuge staff conducts activities on Migratory Bird Day and Take a Kid Fishing Day. Environmental Education is integrated with recreational opportunities. No facilities or developed programs are available, and little outreach is dedicated to environmental education.
4. Lombard Crossing historical display is accessible.

Alternative 1 C3. Goal: Resource Protection

Protect Refuge resources from adverse natural and/or man-made impacts.

1. The primary public use brochure (Seedskadee NWR travel map and general information) contains a map of the Refuge showing designated roads and facilities, and explains Refuge regulations and resources. This brochure is available at the headquarters, at 15 primary entrance locations, the WYG&F, Farson visitor center, and Green River/Rock Springs Chamber of Commerce.
2. The Refuge staff makes available hunting and fishing regulations and access information (parking, road closures, hunting closures, ORV regulations, opportunities for people with disabilities).
3. Known River hazards are posted.
4. Directional signs are provided on most of the Refuge to help guide visitors along designated roads. A recent road numbering system was installed along roads in the north section of the Refuge to help protect habitat and reduce off-road vehicle use. This system will eventually be installed in the south end of the Refuge. Additional signs will be installed, especially in the southern reaches of the Refuge to facilitate the visitors experience and reduce impacts to resources.
5. No monitoring of public use occurs except for use by commercial operations.
6. The remaining five acres of privately held land within the Refuge boundary would be purchased when there is a willing seller. No additional new lands would be acquired. No lands would be disposed.
7. Surface use is subject to Refuge approval and stipulations.
8. Several rights-of-way and easements currently exist within the Refuge. Rights-of-way are reviewed and approved on a case-by-case basis.
9. The Refuge has a Fire Management Plan and an Interagency Dispatch Plan. All wildfires are suppressed using the "closest forces concept" and appropriate suppression strategies. A cooperative agreement for fire suppression exists with local, State, and other Federal agencies in the area.
10. Law enforcement is conducted year-round as staff and time permit and in response to emergencies and information tips.
11. Access to water for livestock is provided to Rock Springs Grazing Association permit holders according to deeded reservation. Access may be via watering lane (water gap), off-site water development or via a Refuge special use permit. Access is also provided as a courtesy to other BLM permit holders through fenced livestock watering lanes (17 water gaps). Existing water gaps are maintained solely at Refuge expense.
12. A single reservation exists on the Refuge for a livestock holding pen and for a calving area at the south end of the Refuge. These would be managed under a Special Use Permit. No permitted grazing is currently ongoing on the Refuge.
13. Livestock trespass occurs; enforcement of trespass is difficult. Boundary fencing is used to exclude livestock but fences are sometimes cut. Trespass occurs largely through watering lanes. Three water gaps need additional rock installed to be considered complete.

Alternative 1 C4. Goal: Cultural Resource

Protect and interpret significant historic and prehistoric cultural sites and objects associated with Refuge lands.

1. Cultural resource protection is largely reactive. The Refuge complies with section 106 of the National Historic Preservation Act. If an undertaking could result in an effect on a significant cultural resource, the Refuge consults with the State Historic Preservation Office (SHPO) and the Advisory Council on Historic Preservation (ACHP). The Refuge staff also consults with the SHPO to assess information needs, locate properties, and to make determinations of eligibility. A cultural resource overview exists for the area (People of the Sage). Little direct protection/stabilization occurs for historic sites.
2. Interpretation of the cultural history of the area is largely limited to the historic period. An interpretive site was constructed at Lombard Ferry site. The site features five interpretive signs, a graveled parking area, and a paved pedestrian path. A replica of the Lombard Ferry was donated to the Refuge and placed at the site. A trail will be constructed to the Ferry in 2001 using Reclamation funding and support from the Mormon Church. The FWS has an interest in interpreting Native American history of the surrounding area. A historical leaflet is available which interprets local and national history of westward expansion and settlement of the area.

Alternative 1 C5. Goal: Partnership

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

1. Cooperation with Reclamation, WYG&F, and BLM continues. Refuge staff conducts ongoing volunteer programs involving student interns, retired persons, community support, and local scout groups.
2. The Refuge participates in the Partners for Wildlife Program for habitat improvement on private lands and Partners in Flight Program for protection and monitoring of migratory birds. The Refuge also has the lead in the Green River Focus Area of the Intermountain West Joint Venture: a cooperative venture with other Federal agencies and with private landowners in the Green River Basin.
3. Locally, the Refuge partners with Trout Unlimited on restoration projects on the Big Sandy River and assists local chamber of commerce groups by providing information for tourism.
4. The Refuge would participate in other neighboring Federal, State and local planning processes.

Alternative 2 (Proposed Action)

Management emphasis would be on restoring riparian function and forest health, restoring historic wetlands types, and enhancing wetlands. The Refuge would be managed for a mix of wetland, riparian, and upland habitats to benefit migratory birds and other native and migratory species as well as threatened, endangered, candidate, and species of special management concern.

Existing wetland units would be managed to provide migratory habitat and incidental breeding habitat. Riparian (floodplain) forest habitat would be restored through a variety of management activities. Limited management would occur in upland habitats. Efforts at cooperative management would be aggressively sought. Monitoring would include long-term habitat change, selected wildlife with an emphasis on migratory birds, threatened and endangered species, public use, and effects of management activities.

Public use opportunities would include wildlife-dependent public uses. In addition, opportunities would be coordinated with other recreational opportunities in the general area such as the Green River Basin. The experience would be largely primitive. Closure and restoration of non-designated roads to protect habitats would be a priority. Additional facilities would be allowed where they support and enhance wildlife-dependent activities or where resource protection or sanitation would be necessary. Facilities and programs would be universally accessible. Opportunities for environmental education and interpretation would be expanded.

Alternative 2 A. Wildlife

Alternative 2 A1. Goal: Threatened and Endangered Species

To restore, enhance, or protect threatened and endangered flora and fauna that currently occur or have historically occurred in the area of Seedskadee NWR.

1. Management of threatened and endangered species would: continue habitat protection, protection of individuals from disturbance, and providing adequate food resources; expand monitoring to include populations and habitat; and allow active habitat management where necessary. Regular monitoring of populations of threatened and endangered, and candidate species and selected species of management concern using the Refuge would occur regularly. A survey of available habitat and habitat quality for all species with potential to use the Refuge would also occur.
2. Surveys would be conducted for Ute ladies'-tresses orchid and its suitable habitat every 5 to 10 years or if current River management flows are changed. Recent surveys (1999) did not detect this species.
3. When necessary, special regulations/closures would be instituted for protection of wildlife species and their habitats on the Refuge.

Alternative 2 A2. Goal: Wildlife

Preserve, restore, and enhance the ecological diversity and abundance of migratory and resident wildlife with emphasis on native species.

1. The Refuge would continue to expand cooperative efforts with WYG&F, the Trumpeter Swan Society, and the Refuge Trumpeter Swan Working Group to improve habitat for the Rocky Mountain population of trumpeter swans. The goal would be to provide breeding habitat for 2 to 3 pairs of trumpeter swans in the Hawley, Hamp, and Pal Units. Efforts would be to minimize disturbance to wintering swans via seasonal closures.
2. Management of moose and mule deer populations consists of setting harvest objectives in conjunction with the WYG&F. Vegetation transects would be initiated to monitor grazing impacts to habitats and success of harvest management strategies. The WYG&F conducts annual aerial surveys to estimate populations.
3. Monitoring of sage grouse habitat and populations will be initiated to evaluate the Refuges contribution to local populations. Habitat will be protected from domestic livestock grazing and off-road vehicle travel.
4. Management of habitat for migratory birds and other indigenous wildlife species is similar to Alternative 1.
5. When necessary, special regulations and closures are instituted for protection of wildlife species and their habitat on the Refuge.

Alternative 2 B. Habitat

Alternative 2 B1. Goal: Riparian

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.

1. Emphasis for mitigation work during this planning cycle would be on restoring, if possible, the dynamic functioning of the Green River and adjacent floodplain forests.
2. A long-term riparian restoration plan based on site specific research would determine effective methods to establish new age classes of woody plant species and restore health to the riparian system. Strategies from that plan would be implemented in a multi-year restoration effort.
3. If feasible and effective (based on research), regeneration of cottonwoods and willows may be achieved on new sites created by increased water availability through manipulated river flows and/or irrigation. Some pole planting may occur at up to 10 suitable sites. Sites for restoration may include the: McCullen, Tallman, Hamp, Pal, Dunkle, Otterson, Johnson, and Big Island management units. Planting of understory shrubs would occur in up to five areas with adequate groundwater. Temporary exclosures may be used to deter browsing.
4. Wells would be installed to monitor groundwater depth and changes in depth in the riparian zone. This information would be used to select sites for restoration efforts.
5. The long-term riparian restoration plan would include a prescriptive flow regime for the Green River through the Refuge to increase the vigor of existing cottonwood/willow communities and to increase riparian regeneration. The flow regime would be proposed to Reclamation; the needs of other affected interests would be integral to the prescription. Implementation would be coordinated with other water uses such as sport fisheries, hydropower generation, and flood control.
6. An agreement would be sought to provide long-term flow regimes geared toward maintenance and regeneration of the riparian plant community.
7. Wildlife would be aggressively managed during the restoration phase to reduce populations of species on the Refuge that heavily browse riparian woody plants (deer, moose, and beaver). Exclosures may be constructed in selected areas to protect regeneration and allow for vegetative recovery.
8. Livestock grazing would not be allowed or used in riparian areas except for habitat management purposes. Fences would be regularly maintained to exclude livestock and trespass laws would be strictly enforced.
9. Work with Reclamation to continue mitigation funding for restoration of riparian willow and cottonwood forests until such as time as the decline of this habitat is reversed and the health of the system improves.

10. Fire would not be used in floodplain forest habitats as long as cottonwoods in those habitats were in poor vigor and not reproducing. Fire may be used in non-forested habitats (shrub or grass/herbaceous vegetation types of the floodplain/lower terraces) to rejuvenate decadent stands of vegetation or control invasive species.
11. A long-term habitat monitoring plan for riparian forested communities including monitoring of "browse transects" would be designed and implemented to determine the success of management activities and the achievement of objectives including growth and vigor of woody plants and their utilization by wildlife. Monitoring Avian Productivity and Survival (MAPS) surveys would occur as necessary for management.

Alternative 2 B2. Goal: Wetland

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

1. Similar to Alternative 1, except wetland development would restore and/or enhance existing wetlands or former wetland types. The existing wetlands in the Pal Management Unit would be enhanced to provide migratory habitat. Development would include little alteration of natural features and use low-head dikes to impound water. Inflow would be passive (gravity flow).
2. A combination of seasonal and permanent water flows would be restored to suitable sites in one to two old river channel (oxbows) by constructing rock sills in the Green River.
3. The Hamp, Hawley, and Pal Units would be managed for breeding and migratory habitat. The remaining wetland units would be managed principally as migratory bird habitat for waterfowl, shorebirds, and wading birds. Wetlands would also be managed to benefit other wetland dependent species.
4. For seasonal/temporary natural wetland areas, management/ maintenance would be through natural river flows and flooding.
5. A Water Management Plan would be applied and modified as necessary to provide shallow wetland habitats for spring and fall migration, and breeding and brood-rearing habitats during summer. Such management would be applied in the Hamp, Hawley, Dunkle, and Pal wetland units. Water management would be varied and mimic natural wet/dry cycles to maintain habitat productivity and diversity while minimizing disturbance to wildlife.
6. Management trapping by Refuge staff for nest predators would occur in Hamp, Hawley, Dunkle, and Pal units.
7. Prescribed fire may also be used in emergent wetlands to maintain open water or to rejuvenate decadent stands of vegetation such as grasses.
8. Vegetative recovery and the kinds and numbers of wildlife species using wetland units, restored oxbows, and natural wetlands would be monitored. Waterfowl production will be monitored once every 3 to 5 years.

Alternative 2 B3. Goal: Uplands

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.

1. Existing stands of tall sagebrush in woody draws would be protected from unplanned disturbance. Small burns with associated monitoring to determine results may occur in greasewood stands to convert them to an early successional state and increase species diversity of grasses and forbs.
2. Habitat management and protection for wildlife species of management concern, such as prairie dog colonies, mountain plover, burrowing owl, and pygmy rabbit, would occur.
3. Fences would be regularly maintained. No domestic livestock grazing would be allowed.
4. Upland vegetation would be sampled to determine distribution, age class, structure, and species composition prior to any treatment.
5. A long-term habitat monitoring program would be instituted in the three upland habitat types to determine effects of management. Distribution and abundance of wildlife species of management concern would be monitored.

Alternative 2 B4. Goal: Riverine

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.

1. Similar to Alternative 1, except that the Refuge would seek closer coordination of management activities and habitat improvements with the WYG&F.

Alternative 2 B5. Goal: Invasive Species

Restore and maintain indigenous flora diversity by controlling the invasion of exotic plant species on the Refuge.

1. The Refuge would decrease dependence on chemical control of plants; increase, where possible, biological and other means of control as they become available. The Refuge would support, where possible, current research on biology and effective control of target species.
2. Refuge staff would more aggressively implement a program to prevent the spread of weeds and new introductions. The Refuge would partner with Reclamation and BLM to develop and implement a control program for salt cedar infestations occurring on lands upstream of the Refuge.
3. Convert fields of tall whitetop in Headquarters area to a mix of grasses and forbs common to area and consistent with cultural practices and IPM techniques.

Alternative 2 C. Public Use, Recreation ,and Resource Protection

Alternative 2 C1. Goal: Wildlife-Dependent Recreation

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.

1. Similar to Alternative 1; however, existing improved roads will be maintained on a regular basis. Parking areas will be provided and signed along all designated roads.
2. Two-tracks and trails identified which currently enter sensitive areas and compromise important wildlife habitat, and two-tracks and other roads determined unnecessary for Refuge management, would be closed and reclaimed. Sixty-five miles of designated roads will be open for public travel (Map 10). Of the 65 miles of open roads, 5.4 miles will be seasonally closed every year from November 15 through March 15 to reduce disturbance to wintering wildlife (Map 10). As appropriate for wildlife protection or road conditions, other roads may be seasonally or temporarily closed. All refuge lands will be open to foot travel.
3. Eleven pullouts would be enhanced along improved roads (auto tour routes) to provide wildlife and habitat viewing site opportunities.
4. One universally accessible nature interpretive trail (near headquarters) would be constructed to offer wildlife viewing/ photography opportunities in major habitats to a complete spectrum of people of various ages and abilities. The trail would have designated accessible parking. No vehicular use would be allowed on trails.
5. An accessible pit toilet would be installed at Dodge Bottoms.
6. Selected species (large antlered moose and deer) would be managed for enhanced wildlife viewing opportunities.
7. Similar to Alternative 1, a comprehensive wildlife observation guide would be available.
8. Special youth activities oriented toward wildlife observation and photography would be established.
9. Similar to Alternative 1, hunting would be a priority public use. Most of the Refuge would be open for game bird, waterfowl, small and big game hunting subject to specific closures or regulation for public safety or resource protection. A new closed area would be established via a separate public process. The closed area would include wetland and riverine habitat and would replace the existing closed areas. 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.
10. Efforts would be made to provide hunting opportunities for people with disabilities.
11. Duck blinds would be allowed (similar to Alternative 1).
12. Decisions on hunting would be influenced by habitat (controlling browse pressure), public use, watchable wildlife needs, and other considerations and would be coordinated with the WYG&F. A fishing and hunting leaflet for the Refuge would be enhanced and professionally printed.

13. Boat launches and parking would continue to be improved. Four designated boat ramps (River at Dodge Bottom, Hay Farm, Highway 28, and 6 Mile Hill) will have cable create installed to improve boat launching. Boat launching would be restricted to developed launches. Road-side pullouts would be delineated for bank anglers in high use areas. Universal access rest rooms would be provided at Dodge Bottoms and the headquarters. River access by vehicle would be limited to designated roads and small improved pullouts. Livestock access lanes will be enhanced by designating parking areas and increased signing to reduce conflicts between livestock and recreationists.
14. Efforts would be made to provide fishing opportunities for people with disabilities.
15. Commercially guided floats would be regulated similar to Alternative 1. Sections of the River through the Refuge may be closed to guided fishing in the future to avoid crowding.
16. Recreational use would be monitored. Use limits and seasonal closure may be instituted if visitor use levels increase to a level which disturbs wildlife, cause resource impacts, or exceed visitor tolerances.
17. The Refuge would cooperate with the WYG&F to create a no-wake zone/restrictions through the Refuge.
18. An interagency River Management Plan would be prepared and implemented to coordinate River use on the Green River among agencies and provide a range of recreational opportunities over the length of the River.
19. Visitors would be provided information on user safety, on who to notify in case of a medical emergency, and on the potential for slow emergency response due to the distance from emergency care providers.

Alternative 2 C2. Goal: Environmental Education and Interpretation

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.

1. Quality interpretive sites on the ecology of Green River and its associated resources, Refuge purposes, issues of concern and other related information would be developed, in partnership with WYG&F at five pullouts along the auto tour route.
2. Interpretive themes at headquarters/visitor center would be carried through the Refuge with signs, overlooks, and tour guide/information brochures.
3. One nature interpretive walking trail (headquarters), one river/floater's interpretive trail, and one cultural trail at the Lombard Ferry site would be developed to educate and inform visitors about the natural and cultural resources found within the Refuge and the importance of riparian areas in the arid west.
4. Interpretive information would be made accessible to all. Existing interpretive signage would be updated.
5. Environmental education emphasis would be on the Refuge's unique resources, riparian systems and their importance to wildlife in the Green River ecosystem. To encourage environmental education independent of the Refuge staff, the staff would conduct a minimum of two on-site teacher training workshops on the Green River and Refuge resources. Opportunities to partner with WYG&F for these workshops would be pursued.
6. An environmental education curriculum package for one wildlife interpretive trail would be developed with assistance from local educators.
7. An environmental education/visitor facility would be constructed next to the headquarters. The facility would be designed and built to 'blend' with the landscape and have an interpretive display area and classroom/demonstration space for up to 30 to 35 students. A fee may be charged for exclusive third party use of the facility.

Alternative 2 C3. Goal: Resource Protection

Protect Refuge resources from adverse natural and/or man-made impacts.

1. The Refuge brochures would be updated and a more detailed travel map produced. Refuge and River use guidelines and regulations would be posted at Refuge entrances, along roads, and at popular public use areas, e.g. boat ramps. Visitors would be provided information on user safety, who to notify in case of a medical emergency, and on the potential for slow emergency response due to the distance from emergency care providers.
2. Directional signs would be added or improved. Road closed signs and other information would provide statements about why closures would be made.
3. Segments of Refuge lands not currently fenced will be evaluated and, where feasible, will be fenced. Segments of current fence which are not "antelope friendly" will be modified to comply with antelope fencing recommendations.
4. The Refuge staff would conduct an active outreach/public relations program establishing relationships with and providing information to State and local governmental officials, neighboring communities, appropriate organizations and interest groups, and State and local media outlets.
5. Cluster facility development in the northwest quadrant of the Refuge and leave the remainder of the Refuge in a primitive and semi-primitive condition.
6. The remaining five acres of privately held land within the Refuge boundary would be purchased if there were a willing seller similar to Alternative 1. 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 (for example, threatened and endangered species) 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.
7. No lands would be disposed of unless in a trade with another Federal agency to further Refuge purposes.
8. 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.
9. No surface occupancy would be allowed for access to privately-owned minerals if they may be otherwise reasonably accessed.
10. 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.
11. Subject to valid existing rights, access to water for livestock would be provided in designated watering lanes only.
12. Providing access to RSGA to water livestock would continue as outlined by the warranty deed. (similar to Alternative 1)
13. Law enforcement would be conducted year-round (similar to Alternative 1). Livestock trespass laws will be strictly enforced.

Alternative 2 C4. Goal: Cultural Resource

Protect and interpret significant historic and prehistoric cultural sites and objects associated with Refuge lands.

1. Similar to Alternative 1; however, the strategy would largely be proactive. The Refuge would comply with Sections 106 and 110 of the National Historic Preservation Act. Known cultural resource sites and potential sensitive areas would be avoided when practical. Adverse effects to sites would be mitigated.
2. The Refuge would obtain data and produce a cultural resource overlay (i.e. map) for its spatial resource information database (GIS) for internal use and avoidance/protection of cultural resources.
3. Significant historic sites would be thoroughly recorded.
4. Interpretation would be based on a unifying theme of people's relationship to and use of the habitat and wildlife in the Green River Basin over time including historic and prehistoric use. The Refuge staff would interpret nationally significant historic sites including Lombard Ferry, the Oregon/Mormon National Historic Trails, and Pony Express Trails and their crossings, Jim Bridger's Trading Post, and locally significant homesteads site. Interpretation of the Lombard Ferry would be incorporated into the existing site. Interest in interpretation of Native American history would be maintained.
5. The historical leaflet would be updated as new information becomes available. Information on prehistoric use of the area would be developed in a variety of formats, including indoor and outdoor exhibits, and leaflets. Sites discussing the use of local plants and animals by people through time would inform visitors of the importance of plants and animals in the human history of the area.
6. A floater's interpretive trail and River guide would be developed to inform and educate River users about natural and cultural resources of the Green River.

Alternative 2 C5. Goal: Partnership

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

1. Cooperation with Reclamation, WYG&F, and BLM continues, and the Refuge staff would actively seek additional volunteer assistance from local organizations, retired persons, and user/interest groups.
2. The staff would encourage and support the development of a local "Friends" organization or other cooperative association to support Refuge goals and assist in future fund raising and cooperative ventures.
3. Partnerships would be developed regionally to assure opportunity for access and programs for peoples with disabilities.
4. The Refuge would continue partnerships similar to Alternative 1.

Alternative 3

Management alternative maximizes wildlife benefits by focusing on habitat protection and enhancement, and describes a reduced public use approach. This Alternative is similar to Alternative 2 with respect to management of habitats and wildlife but de-emphasizes public use enhancements.

The public use experience would be primitive with uncrowded conditions and center on the compatible wildlife-dependent priority public uses. No additional improvements to public use and supporting facilities would occur. The miles of roads open for public travel would be reduced to protect habitat and reduce disturbance to wildlife. Commercial use of the River would be discontinued.

Alternative 3 would be the same as Alternative 2 with the following exceptions.

Alternative 3 A. Wildlife

Alternative 3 A1. Goal: Threatened and Endangered Species

To restore, enhance, or protect threatened and endangered flora and fauna that currently occur or have historically occurred in the area of Seedskadee NWR.

1. Similar to Alternative 2.

Alternative 3 A2. Goal: Wildlife

Preserve, restore, and enhance the ecological diversity and abundance of migratory and resident wildlife with emphasis on native species.

1. Similar to Alternative 2.
2. Hunting for sage grouse, snipe, mourning dove, and rails would be discontinued to reduce hunting pressure, simplify hunting seasons, and reduce general disturbance to wildlife on the Refuge.
3. The waterfowl hunting season would end December 1 to reduce disturbance to wintering wildlife, specifically providing an area where waterbirds can rest and feed. Ice formation in backwaters limits the use of wetland impoundments after early November.

Alternative 3 B. Habitat

Alternative 3 B1. Goal: Riparian

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.

1. Similar to Alternative 2.

Alternative 3 B2. Goal: Wetland

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

1. Similar to Alternative 2.

Alternative 3 B3. Goal: Uplands

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.

1. Similar to Alternative 2.

Alternative 3 B4. Goal: Riverine

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.

1. Similar to Alternative 2.

Alternative 3 B5. Goal: Invasive Species

Restore and maintain indigenous flora diversity by controlling the invasion of exotic plant species on the Refuge.

1. Similar to Alternative 2.

Alternative 3 C. Public Use, Recreation, and Resource Protection

Alternative 3 C1. Goal: Wildlife-Dependent Recreation

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.

1. The auto-tour would remain as in Alternative 1. No additional interpretation facilities would be created. Parking areas would be delineated along designated roads. Existing pullouts would be enhanced along improved roads (auto tour routes) to provide wildlife and scenic viewing opportunities.
2. Fifty-nine miles of roads would be open for public travel (Map 11). This Alternative has the fewest miles of roads open to public use in order to minimize disturbance to wildlife and habitat. As appropriate for wildlife protection or road conditions, other roads may be seasonally or temporarily closed. All areas remain open for foot travel.
3. Hunting would continue as a priority public use but hunting for mourning doves, rails, snipes, and sage grouse would be discontinued. Hunting closures would be implemented similar to Alternative 2. The waterfowl hunting season would be shortened and end December 1 to reduce disturbance to wintering wildlife.
4. The River would be closed for commercial use.
5. The Refuge would cooperate with the WYG&F to create a no-motorized water craft zone through the Refuge. Motors would be allowed for emergency purposes only.
6. Visitor use levels on the River would be determined by a future Reclamation and FWS study. Use levels and resource impacts would be monitored. If visitor use levels increase to a level where resource impacts occur, areas may be closed temporarily or permanently to protect wildlife and habitat, and to maintain the primitive character.
7. No new trails would be created.
8. Similar to Alternative 1, a comprehensive wildlife observation guide would be available.
9. Special youth-oriented activities would be maintained similar to Alternative 1. No new activities would be pursued.
10. Hunting and fishing opportunities for people with disabilities would be provided informally and on a requested basis.
11. Decisions on hunting and fishing would be controlled similar to Alternative 1. A new fishing and hunting leaflet would be developed.
12. There would be no additional improvements to boat ramps and roads.
13. Recreational use would be monitored. Use limits and seasonal closure may be instituted if visitor use levels increase to a level which disturbs wildlife, causes resource impacts, or exceeds visitor tolerances.

Alternative 3 C2. Goal: Environmental Education and Interpretation

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.

1. Wildlife viewing would be self-guided. No new environmental education facilities would be developed at the Refuge.
2. No new interpretive signing would be created. Existing interpretive displays would be updated.
3. Additional trails would not be created.
4. The development of a River interpretive brochure and the creation of teacher curriculum packages would not be pursued.

Alternative 3 C3. Goal: Resource Protection

Protect Refuge resources from adverse natural and/or man-made impacts.

1. Visitors would be provided information on universal access and the best user opportunities for people with disabilities. Universal access would be provided on a case-by-case basis.
2. No new public use facilities would be developed that require management and maintenance by the Refuge.
3. The remaining five acres of privately held land within the Refuge boundary would be purchased if there were a willing seller similar to Alternative 1. 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 (for example, threatened and endangered species) 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.
4. No surface occupancy would be allowed within the Refuge boundary for development of privately-owned minerals.
5. Rights-of-way through the Refuge would be denied if alternative routes were available.
6. Off-site water for livestock watering would be developed and grazing or trailing of livestock would be eliminated on Refuge lands.

Alternative 3 C4. Goal: Cultural Resource

Protect and interpret significant historic and prehistoric cultural sites and objects associated with Refuge lands.

1. Similar to Alternative 1; however, little other formal protection or stabilization occurs.

Alternative 3 C5. Goal: Partnership

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

1. Similar to Alternative 2.

Table 1. Seedskadee NWR Alternative Comparison Summary

Issue Questions	Alternative 1 - No Action	Alternative 2 - Preferred Alternative	Alternative 3
Threatened and Endangered Wildlife and Plant What measures are taken to protect threatened, endangered, and candidate species and species of management concern?	Management for T/E species consists primarily of habitat protection, protection of individuals from disturbance, providing adequate food resources, and some population monitoring.	Management of T/E species would continue with habitat protection, protection of individuals from disturbance, providing adequate food resources; expand monitoring to include populations and habitat; and allow active habitat management where necessary. Regular monitoring of populations of all sensitive species occurs. Surveys are conducted.	Same as Alternative 2.
	Special regulations/closures are instituted for protection of wildlife species and their habitat on the Refuge.	Same as Alternative 1.	Same as Alternative 1.
Wildlife What measures are taken to protect and manage native wildlife?	Hawley wetland managed for breeding trumpeter swans. Winter river flows maintained to keep areas ice free for wintering swans. Refuge cooperates with WYG&F in reestablishment of the Rocky Mtn. Trumpeter Swan population.	Refuge works to expand trumpeter swan nesting areas. Efforts to reduce disturbance to wintering waterfowl via seasonal road closures.	Same as Alternative 2.
	Moose and deer managed in cooperation with WYG&F.	Similar to Alternative 1; establish vegetative monitoring transects to evaluate management actions.	Same as Alternative 2.
	Sage grouse management involves protection of habitat.	Initiate population and habitat monitoring for sage grouse.	Similar to Alternative 2; however, hunting for sage grouse, snipe, mourning dove and rails are discontinued.
	Management of habitat for migratory birds and other indigenous wildlife species focuses on habitat protection.	Similar to Alternative 1; focus on additional enhancement of all habitat types and vegetative monitoring	Same as Alternative 2.
	When necessary, special regulations and closures are instituted for protection of wildlife species and their habitat.	Same as Alternative 1.	Same as Alternative 1.

Table 1. Seedskadee NWR Alternative Comparison Summary

Issue Questions	Alternative 1 - No Action	Alternative 2 - Preferred Alternative	Alternative 3
Riparian How will riparian habitat losses be mitigated to support migratory birds and native wildlife species?	A riparian restoration pilot project has been conducted. Restoration includes an emphasis on woody species planting.	Emphasis on restoring the dynamic functioning of the Green River and adjacent floodplain forests. Long-term riparian restoration plan developed.	Same as Alternative 2.
		Refuge will explore regeneration of cottonwoods and willows on new sites (McCullen, Tallman, Otterson, Johnson, and Big Island management units) created by increased water availability through manipulated River flows and/or irrigation. Pole planting at suitable sites.	Same as Alternative 2.
	Planting of understory shrubs in up to 9 sites. Repellants and plant barriers used to deter browsing. No monitoring wells installed.	Planting of understory shrubs in up to 5 areas. May be fenced to deter browsing. Wells installed to monitor groundwater depth and changes in depth in the riparian zone.	Same as Alternative 2.
	The flow regime for the Green River through the Refuge is managed by USBR for its project purposes and consistent with downstream water rights and commitments.	A prescriptive flow regime for the Green River through the Refuge would be established with USBR to increase the vigor of existing cottonwood/ willow communities and riparian regeneration.	Same as Alternative 2.
B1. Issue: How will riparian habitats be managed to support migratory birds?	See flow regime under A2.	See flow regime under A2.	Same as Alternative 2.
	There is little control of native wildlife that browse. A special hunt for mule deer occurs outside the regular season to reduce their numbers.	Wildlife that heavily browse riparian woody plants aggressively managed during the restoration phase. Exclosures may be constructed. Fire not used in floodplain forest while in poor vigor and not reproducing.	Same as Alternative 2.
	Livestock grazing not allowed or used in riparian areas.	Same as Alternative 1.	Same as Alternative 1.

Table 1. Seedskadee NWR Alternative Comparison Summary

Issue Questions	Alternative 1 - No Action	Alternative 2 - Preferred Alternative	Alternative 3
	Monitoring - There is no regular monitoring program specific to riparian forested communities.	Monitoring - A long-term habitat monitoring plan for riparian forested communities established. MAPS monitoring may occur periodically.	Same as Alternative 2.
Wetlands How will wetland losses be mitigated to support migratory birds and native wildlife species?	Three oxbow wetlands have been restored in the McCullen Bluff, Hawley, and Hamp units. Wetlands' creation and enhancements in the Hamp, Hawley, Lower Hawley, and Dunkle Units. Further mitigation focus on restoring historical, enhancing existing, and creating new wetlands. One wetland complexes will be developed in the Pal management units.	Similar to Alternative 1, except wetland development would restore and/or enhance existing or former wetlands. Pal Management Unit enhanced.	Same as Alternative 2.
	One additional sill would divert water from the Green River into historic side channels and restore associated wetland habitat. Natural topography used to minimize soil disturbance and alterations to natural features.	Similar to Alternative 1, except one additional oxbow may be restored if feasible.	Same as Alternative 2.
How will wetlands be managed to support migratory birds and native wildlife species?	Existing wetlands units (Hamp, Hawley, Dunkle) are managed to provide migratory and breeding habitat for waterfowl, shorebirds, and wading birds.	Hamp, Hawley, and Pal Units managed for breeding and migratory habitat. The remaining wetland units managed as migratory habitat for waterfowl, shorebirds, and wading birds. For seasonal/temporary natural wetland areas, management/ maintenance through natural river flows and flooding.	Same as Alternative 2.
	A Water Management Plan applied and modified to provide shallow wetland habitats for spring and fall migration, and breeding and brood-rearing areas.	Similar to Alternative 1; however, the Water Management Plan applied in the Hamp, Hawley, and Pal units. Water management varied and mimic natural cycles. Prescribed fire may be used to control emergent vegetation.	Same as Alternative 2.

Table 1. Seedskadee NWR Alternative Comparison Summary

Issue Questions	Alternative 1 - No Action	Alternative 2 - Preferred Alternative	Alternative 3
	Monitoring: Little for wildlife use; infrequent for waterfowl production; no vegetative monitoring.	Monitoring: Yes for wildlife species using wetland units, restored oxbows and natural wetlands. Infrequent for waterfowl production	Same as Alternative 2.
How are predators and nuisance species controlled?	Predator Management Plan followed. Management trapping occurs in the Hawley and Dunkle unit for nest predators during waterfowl nesting season. Beaver removed when significant damage occurs. Animals live-trapped where possible. Trapping permits issued for management purposes.	Similar to Alternative 1. Management trapping by Refuge staff for nest predators may occur in the Hamp, Hawley, Dunkle, and Pal management units during breeding season.	Same as Alternative 2.
Upland How would upland shrub and grassland habitat be managed to support native wildlife species and migrating birds?	Upland areas are fenced, but not intensively managed. Grazing and prescribed fire have not been used as a management tool.	Habitat management/ protection for wildlife species of management concern. Fences maintained. Stands of tall sagebrush in woody draws protected. May conduct small burns with monitoring in greasewood stands to convert to an early successional state and increase species diversity of grasses and forbs. No domestic livestock grazing allowed.	Same as Alternative 2.
	No monitoring.	Vegetation monitoring prior to any treatment. Long-term habitat monitoring program instituted. Monitoring of wildlife species of management concern.	Same as Alternative 2.
Riverine How are fisheries managed on the Refuge?	WYG&F manages the cold-water (sport) fishery. Cooperation occurs with fishery habitat improvements.	Similar to Alternative 1; except closer coordination with WYG&F.	Same as Alternative 2.
Weeds To what extent are weeds (invasive, nonnative plants) controlled?	Weed control efforts targeted to small, spreading infestations and to preventing existing large populations from seeding. Integrated Pest Management Plan used.	Similar to Alternative 1; however, more aggressive. Decrease dependence on chemical control. Fields of tall whitetop in Headquarters area converted to mix of grasses and forbs.	Same as Alternative 2.

Table 1. Seedskadee NWR Alternative Comparison Summary

Issue Questions	Alternative 1 - No Action	Alternative 2 - Preferred Alternative	Alternative 3
		Partner with USBR and BLM to control upstream salt cedar infestations	Same as Alternative 2.
Public Use and Recreation Wildlife Viewing and Photography To what extent are opportunities provided for wildlife viewing and photography?	Comprehensive wildlife observation guide is available. No special accommodation made for photography. Nine mile long seasonal wildlife auto-tour route exists. One overlook at wetland unit near Refuge headquarters.	Similar to Alternative 1; however, existing 15 miles of improved road system maintained on a regular basis. Pullouts enhanced along auto-tour route.	Same as Alternative 2.
		Selected species managed for enhanced wildlife viewing opportunities.	Same as Alternative 2.
		One nature trail developed near Headquarters.	No new trails developed.
Hunting What types of hunting opportunities are provided on the Refuge?	Refuge partners with WYG&F to manage hunting. Hunting plan updated annually. Hunting is allowed in all but two areas. Temporary duck blinds made from artificial materials or dead down materials allowed. Special doe deer hunt to reduce population. Hunting opportunities for persons with disabilities provided on a requested basis.	Similar to Alternative 1. Most of the Refuge open for game bird, waterfowl, small, and big game hunting subject to closures or regulation for public safety or resource protection. A new closed area established via a separate public process. Efforts would be made to provide hunting opportunities for people with disabilities. Blinds permitted similar to Alternative 1.	Similar to Alternative 2; however, seasons for sage grouse, rails, snipe, and mourning doves would be discontinued. Waterfowl season on Refuge lands shortened to end December 1. Hunting opportunities for persons with disabilities provided on a requested basis.
Recreational Trapping What types of recreational trapping are allowed on the Refuge?	Recreational trapping is allowed by special use permit for management purposes only. Trappers must be experienced and licensed with the State of Wyoming.	Same as Alternative 1.	Same as Alternative 1.
Sport Fishing What types of sport fishing opportunities are provided on the Refuge?	The Green River is managed by WYG&F as a trophy trout fishery; State regulations apply. The Refuge provides informal launch sites and parking. Recreational fishing is unlimited. "Take A Kid Fishing Day" is one of the principal outreach activities.	Similar to Alternative 1, Four boat ramps developed with parking and improved ramps. Boat launching restricted to developed launches. Road-side pullouts provided for bank anglers in high use areas. Accessible rest rooms provided at Dodge Bottoms.	Similar to Alternative 1, except no additional enhancements to existing boat launching facilities.

Table 1. Seedskadee NWR Alternative Comparison Summary

Issue Questions	Alternative 1 - No Action	Alternative 2 - Preferred Alternative	Alternative 3
Commercial Guide Fishing/ Floating Is commercial guide fishing/floating allowed and how is it managed?	Commercially guided scenic floats and fishing trips allowed from the north boundary to the take-out downstream of the Big Sandy confluence (6 Mile Hill boat ramp).	Similar to Alternative 1.	No commercial guided fishing or guided scenic tours would be authorized.
	Fee permits issued on an annual basis. Currently 6 permits. Through attrition, reduce number to 4 or less. The season is from April 1 to October 30. The number of boats per day/outfitter and the number of boats per day/section of river limited. Daily use is first-come, first-served and coordinated by permittees. Permittees can provide both fishing and scenic tours.	Similar to Alterative 1.	No permits issued.
	Use data required from permitted guides. Formal monitoring of recreational use not conducted by Refuge.	Recreational use monitored and commercial permitted use enforced on the river by Refuge staff. If visitor use levels increase to a level at which wildlife disturbance occurs, resource impacts occur, or which exceed visitor tolerances, use limits and seasonal closures instituted.	Monitoring of recreational use similar to Alternative 2.
Camping Is camping allowed, and if so, where and how are sites developed and the use managed?	Refuge closed after dark. No camping or overnight parking is provided on the Refuge. Visitors directed to facilities outside the Refuge.	Same as Alternative 1.	Same as Alternative 1.
Boating Is boating allowed on the River through the Refuge?	Unrestricted boating allowed on the river through the Refuge. Most use is by non-motorized water craft.	Refuge cooperates with WYG&F to create a no-wake zone restrictions through the Refuge. Interagency River Management Plan prepared and implemented to coordinate river use on the Green River.	Refuge cooperates with WYG&F to create a no-motor water craft zone through the Refuge.

Table 1. Seedskadee NWR Alternative Comparison Summary

Issue Questions	Alternative 1 - No Action	Alternative 2 - Preferred Alternative	Alternative 3
Visitor Use Level What is the appropriate visitor use level of the Refuge?	Visitor use levels not limited except for commercial use on the River.	Similar to Alternative 1; however, current and proposed future use levels on the river determined by future recreational use studies. Use levels and resource impacts monitored. If visitor use levels increase to a level where resource impacts occur, areas may be closed temporarily or permanently to protect wildlife and habitat.	Same as Alternative 2.
Access Management How is access/travel managed on the Refuge?	All vehicle travel restricted to existing designated roads. Seventy-seven miles of roads are open to public travel. Some spur two-track closures have occurred. Contain traffic to designated roads via signing. Closed roads allowed to naturally revegetate. Parking occurs haphazardly. All areas are open to foot travel.	Two-tracks and trails identified which currently enter sensitive areas and compromise important wildlife habitat, and two-tracks and other roads determined unnecessary for Refuge management, would be closed and reclaimed. Sixty-five miles of designated roads will be open for public travel. Of the 65 miles of open roads, 5.4 miles will be seasonally closed every year from November 15 through March 15 . As appropriate for wildlife protection or road conditions, other roads may be seasonally or temporarily closed. All refuge lands will be open to foot travel.	Fifty-nine miles of roads would be open for public travel. This Alternative has the fewest miles of roads open to public use in order to minimize disturbance to wildlife and habitat. As appropriate for wildlife protection or road conditions, other roads may be seasonally or temporarily closed. All areas remain open for foot travel.

Table 1. Seedskadee NWR Alternative Comparison Summary

Issue Questions	Alternative 1 - No Action	Alternative 2 - Preferred Alternative	Alternative 3
River Access How is River access managed?	Informal vehicle parking and boat launching areas have been "established" by users over the years. Maintain four improved boat ramps with parking areas. Reduce development of two-track roads.	Four designated boat ramps with associated parking developed at Dodge Bottom, Hay Farm, Highway 28, 6 Mile Hill. Further improve boat ramps with cable create. Improve directional signing and provide road pullouts at key locations. Improve control of access by signing designated roads. Livestock access lanes will be enhanced by designating parking areas and increased signing to reduce conflicts between livestock and recreationists.	Same as Alternative 1. Same as Alternative 2. Livestock lanes eliminated and off site water established.
Universal Access To what extent is universal access to public use facilities and activities provided?	The Headquarters public rest room is universally accessible. Lombard Crossing historical display is accessible. Accessibility will be a high priority in developing new facilities and public use opportunities. Otherwise access is informal and on a requested basis.	Similar to Alternative 1, in addition new facilities universally accessible. A range of accessible wildlife-dependent recreational activities provided. Efforts made to provide hunting and fishing opportunities for people with disabilities.	Similar to Alternative 1. Visitors would be provided information on universal access and the best user opportunities for people with disabilities. Limited facility development planned. Universal access would be provided on a case-by-case basis.
Environmental Interpretation and Education Environmental Interpretation To what extent are opportunities pursued to interpret natural resources, especially wildlife and their habitat for the visiting public?	Interpretive exhibits at headquarters, a portable exhibit for interpretive outreach, an information kiosk, two interpretive signs at the Overlook. No interpretive "trails" exist on the Refuge.	Similar to Alternative 1. Add pullouts and interpretive sites along the auto-tour route. Interpretive themes at Headquarters visitor area carried out through the Refuge. One nature interpretive walking trail (near Headquarters), one river floater's interpretive "trail," and one cultural trail at Lombard Ferry. Interpretive information made accessible to all. Existing interpretive signs updated.	Same as Alternative 1.

Table 1. Seedskadee NWR Alternative Comparison Summary

Issue Questions	Alternative 1 - No Action	Alternative 2 - Preferred Alternative	Alternative 3
Environmental Education What type of environmental education program is provided to the public?	Refuge provides tours to schools, civic groups, and other organizations upon request. Environmental education is integrated with recreational opportunities.	Similar to Alternative 1, with the following additions: EE emphasis on K-12. Refuge conducts a minimum of two on-site teacher training workshops on the Green River and Refuge resources. Opportunities to partner pursued. EE curriculum packages for interpretive trails developed. A new education/visitor accessible center located near headquarters.	Similar to Alternative 1. Wildlife viewing would be self-guided. No new environmental education facilities would be developed at the Refuge. No additional educational programs developed.
Resource Protection Public Information How is information on the Refuge, its resources, and regulations provided to the public?	A general Refuge brochure, historical brochure, hunting and fishing regulations, and access information are available upon request.	Similar to Alternative 1; however, all brochures updated, and a more detailed travel map produced. Refuge and River use guidelines and regulations posted.	Same as Alternative 2.
	Known river hazards are posted.	Visitors provided information on user safety and emergency help notification.	Same as Alternative 1.
	Few directional signs are provided.	Directional signs added or improved.	Same as Alternative 2.
	Outreach and public relations programs provided upon request if staff are available.	Refuge staff conducts an active outreach/public relations program to establish relationships and provide information to state and local governmental officials, neighboring communities, appropriate organizations and interest groups, and state and local media outlets.	Same as Alternative 1.
	Facility development is not clustered.	Facility development clustered in the northwest quadrant of the Refuge with the remainder of the Refuge in a primitive and semi-primitive condition. Install accessible toilet at Dodge Bottoms.	Same as Alternative 2.

Table 1. Seedskadee NWR Alternative Comparison Summary

Issue Questions	Alternative 1 - No Action	Alternative 2 - Preferred Alternative	Alternative 3
Cultural Resources How are cultural resources protected?	Resource protection largely reactive. The Refuge complies with section 106 of the National Historic Preservation Act and consultation with the State Historic Preservation Office (SHPO) and the Advisory Council on Historic Preservation (ACHP) occurs.	Similar to Alternative 1; however, more proactive. Refuge complies with Sections 106 and 110 of the NHPA. A Class III pedestrian cultural resource survey would be conducted for Refuge areas not previously surveyed. Known cultural resource sites and potential sensitive areas avoided when practical. Adverse effects to sites would be mitigated. A cultural resource overlay (i.e. map) is produced for its spatial resource information data base (GIS).	Same as Alternative 1.
	Little direct protection/stabilization occurs for historic sites.	Significant historic sites would be thoroughly recorded.	Same as Alternative 1.
To what extent are opportunities pursued to interpret cultural resources for the visiting public?	Interpretation of the cultural history of the area limited to the historic period. An interpretive site at Lombard Ferry site with a Lombard Ferry replica. There is interest by the FWS to interpret Native American history of the surrounding area. An historical leaflet is available which interprets local and national history of westward expansion and settlement of the area.	Similar to Alterative 1; however, the interpretation based on a unifying theme. Refuge interprets nationally significant historic sites including ferries, the Oregon/Mormon Pioneer and Pony Express Trails and their crossings, Jim Bridger's Trading Post and locally significant homesteads site. Incorporate interpretation the Lombard Ferry replica into the existing Lombard Crossing interpretive site. Historical leaflet updated.	Similar to Alternative 1; however, no new facilities developed that require management and maintenance by the Refuge.
Partnership To what extent are partnership opportunities pursued with volunteers, local service groups, organizations, individuals, schools, and other governmental agencies?	Cooperation with USBR, WYG&F, and BLM continues. Refuge conducts ongoing volunteer program.	Similar to Alternative 1, plus seek additional volunteer assistance. Encourage and support the development of a local "Friends" organization or other cooperative association.	Same as Alternative 1.

Table 1. Seedskadee NWR Alternative Comparison Summary

Issue Questions	Alternative 1 - No Action	Alternative 2 - Preferred Alternative	Alternative 3
	The Refuge looks for partnering opportunities to provide interpretive facilities at the Lombard Crossing site.	Same as Alternative 1.	Same as Alternative 1.
	The Refuge participates in the Partners for Wildlife Program and Green River Focus Area of the Intermountain West Joint Venture.	Same as Alternative 1.	Same as Alternative 1.
	The Refuge will participate in other neighboring Federal, State and local planning processes.	Same as Alternative 1. Encourage the development of a study with USFWS, BLM, and USBR to establish eligibility and suitability of designating the Green River as wild, scenic, and recreational river. Partnerships developed regionally to assure opportunity for access and programs for peoples with disabilities.	Same as Alternative 1.
Administrative Management Concerns Land Acquisition Is further land acquisition or land disposal planned?	Remaining five acres of privately held land within the Refuge boundary purchased on a willing seller basis. No additional new lands acquired.	Similar to Alternative 1.	Same as Alternative 1.
		Other lands considered for acquisition if necessary for management of selected species or for mitigation purposes.	Same as Alternative 2.
		Additional land acquisition or disposal would go through a public involvement process.	Same as Alternative 2.
	No lands would be disposed.	No lands disposed of unless in a trade with another Federal agency to further Refuge purposes.	Same as Alternative 2.

Table 1. Seedskadee NWR Alternative Comparison Summary

Issue Questions	Alternative 1 - No Action	Alternative 2 - Preferred Alternative	Alternative 3
Minerals How will privately-owned minerals be developed?	Surface use subject to Refuge approval and stipulations.	Mineral exploration and development 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. No surface occupancy allowed for access to privately-owned minerals if they could be otherwise reasonably accessed. Acquisition of minerals may be considered at select sites if resource/public use conflicts occur and cannot be mitigated under use and occupancy stipulations.	No surface occupancy allowed within the Refuge boundary for development of privately-owned minerals.
Rights-of-Way What is the Refuge's policy toward requests for grants of ROW across the Refuge?	Several ROWs and easements currently exist within the Refuge. ROWs are reviewed and approved on a case-by-case basis.	ROWs reviewed and approved on a case-by-case basis. ROWs through Refuge would be denied if feasible alternative routes are available. If no alternative route available, restrict ROW to existing utility corridors with Refuge stipulations.	ROWs through Refuge would be denied if alternative routes are available.
Livestock Access How is access to water for livestock provided?	Access to water livestock provided to Rock Springs Grazing Association permit holders according to deeded reservation. Access to water may be via watering lane, off-site water development, or by a Refuge Special Use Permit. Access provided as a courtesy to other BLM permit holders through fenced livestock watering lanes (water gaps). Existing lanes maintained solely at Refuge expense.	Subject to deeded reservation. Similar to Alternative 1.	Off-site water would be developed where possible. Trailing of livestock through the Refuge to access water would be eliminated.

Table 1. Seedskadee NWR Alternative Comparison Summary

Issue Questions	Alternative 1 - No Action	Alternative 2 - Preferred Alternative	Alternative 3
Grazing Is grazing allowed on the Refuge? What is the Refuge doing to prevent livestock trespass?	A single reservation exists on the Refuge for a livestock holding pen and for a calving area at the south end of the Refuge. These will be managed under a Special Use Permit. No permitted grazing is currently ongoing on the Refuge. Livestock trespass occurs; enforcement of trespass difficult. Boundary fencing used to exclude livestock.	Similar to Alternative 1. Upon completion of the Refuge boundary fence and watering lanes, livestock trespass laws would be strictly enforced. The Refuge would continue to try new designs for watering lanes to prevent trespass. The boundary fence will be regularly checked and repaired as necessary.	Same as Alternative 1. Same as Alternative 2; however, efforts would be made to remove water lanes and develop off-site water sites.
Fire Management How is fire managed on the Refuge?	Fire Management Plan and an Interagency Dispatch Plan followed. Wildfires suppressed. A cooperative agreement for fire suppression exists with local, State, and other Federal agencies in the area.	Same as Alternative 1.	Same as Alternative 1.

Chapter 3. Affected Environment: Resource Inventory

Chapter 3 of the EA incorporates by reference Chapter 3 - Refuge and Resource Description of the CCP.

Chapter 4. Environmental Consequences

The following effects discussion is organized by Seedskadee NWR goals and the issues identified during the public process, by the general public, interested agencies, and organizations.

Alternative 1 Present Management Continues
Alternative 1 Wildlife
Alternative 1 Threatened and Endangered Plants and Wildlife

Generally, beneficial effects may occur to threatened, endangered, candidate, and wildlife species of management concern from habitat protection, limiting disturbance to individuals, provision of adequate food resources, and minimal population monitoring. Continued or increased disturbance by winter visitors to wintering waterfowl, trumpeter swans, and other sensitive species continues to be an issue under this Alternative.

Sensitive species that are dependent upon riparian shrub communities along the River and riparian forest may experience continued degradation of their habitats. Under Alternative 1, there is no assurance that the riparian forest along the Green River would be preserved. Current impacts from invasive species, uncontrolled visitor access, and the lack of public use monitoring may continue to impact sensitive vegetation and riparian areas, thus reducing the quality of potential habitat for sensitive wildlife and plant species.

Alternative 1 Wildlife and Habitat

Management of the existing Hawley wetland unit for trumpeter swans would continue to benefit this species in addition to numerous other wetland dependent species. Development of an additional wetland unit would increase benefits for a variety of wetland species. Management of winter flows to maintain ice free waters will continue to benefit a variety of wintering bird species.

Management of moose and deer would continue but lack of vegetative monitoring would make evaluation of management strategies difficult. Enhancement of portions of the riparian corridor would benefit a variety of avian and mammal species; however, riparian restoration efforts may be jeopardized without proper management of herbivores.

Protection without active management of upland habitats may eventually result in degraded habitat conditions for the sage grouse and other upland species. Lack of monitoring in upland habitats for grouse and other species makes management programs difficult to develop and eventually evaluate.

Current impacts from invasive species, uncontrolled visitor access, and the lack of public use monitoring may continue to impact all habitat types, thus reducing the quality of potential habitat for all wildlife and plant species.

Alternative 1 Riparian

The operation of Fontenelle Dam and Reservoir moderates flows of the Green River below the dam from what would be experienced if the dam were not in place. The high peaks of major high flow events are substantially reduced below the dam. Channelizing has likely incised the River channel. Coupled with lower peak flows and timing changes in restricted flows, the hydrologic system through the Refuge has changed depriving woody plants and seeds of adequate water when needed to sustain the historic plant communities and also has resulted in many fewer disturbed sites where regeneration can take place. These circumstances negatively effect the riparian habitat within the Refuge. Higher than historic winter flows have also increased ice scouring which, over the winter, essentially cuts off cottonwood seedlings that have emerged along the River banks.

The riparian forest would continue to age, be in poor health when compared with the upstream forest above Fontenelle Reservoir, remain simpler in structure, and have insufficient regeneration to establish new age classes. Under these continued conditions, the existing riparian forested habitat, which is crucial for migrating and breeding songbirds, may severely deteriorate. Without management intervention over the long-term, the forest is likely to die out.

Riparian forest provides habitat for the greatest number of migratory bird species on the Refuge. Countless numbers and species of birds rely on the riparian forest of the Green River to migrate to and from their breeding areas to the north. Birds use this habitat for foraging, roosting, and cover during migration. Forest breeding birds that winter in Central and South America are not capable of migrating solely through the arid semidesert shrubland that predominates much of Utah, Colorado, and Wyoming. Instead, they rely on the north-south riparian forest corridor of the Colorado and Green Rivers.

The planting of understory woody shrubs in up to nine sites would increase the shrub cover for wildlife and migratory birds.

Riparian habitat may continue to be negatively effected by the insufficient control of native wildlife such as deer, moose, and beaver that browse on woody plants. Some effort is made to reduce the number of mule deer that browse by holding a special hunt. While the riparian forest is managed for migratory birds, without ongoing monitoring of ungulate and deer populations, the degree of success would be unmeasured.

Alternative 1 Wetland

Providing one additional managed wetland complex in the Upper Hawley and Pal Management Units would benefit migratory and breeding habitat for waterfowl, shorebirds, and wading birds.

Breeding habitat consists of areas where courtship and breeding may occur; suitable nest sites are available; and adequate resources are available to sustain birds through fledgling from the nest. Existing nesting islands are inadequately designed and are infested with perennial pepperweed. These problems are unresolved in Alternative 1.

The continuation of predator trapping in the Hawley and Dunkle units has a beneficial effect for ground-nesting birds. Apparent nesting success over the last five years has been over 65 percent. However, in the other units where trapping is not occurring, nest success would continue to be a management concern.

Water within the wetland units is managed for shallow wetland habitats for the spring and fall migration and breeding and brood-rearing areas to ensure the most successful result for migratory birds. Species that benefit by this Alternative include the trumpeter swan, Canada goose, numerous species of ducks, the marsh wren, red-winged blackbird, yellow-headed blackbird, tiger salamander, boreal chorus frog, northern leopard frog, mink, and muskrat. However, with limited wildlife and waterfowl production monitoring, the degree of success would be unmeasured.

Restoring historic oxbow river channels may provide additional spring migration, breeding, or fall migration habitats for birds. Restorations would also improve conditions for fisheries by providing spawning, nursery, or overwintering areas.

Alternative 1 Uplands

Sagebrush habitats are not monotypic but in fact consist of a mosaic of shrub types of which sagebrush is the most dominant. The largest block of upland habitat (sagebrush, salt shrub, greasewood, and grass) is the Dry Creek Unit which is fenced and free of grazing by domestic livestock. This practice has resulted in an upland system closer to approximation of natural conditions (prior to introduction of grazing in the last century) than anywhere else in the immediate region. Therefore, overtime, without intensive management, this system should be vital to and supporting of native wildlife species and migratory birds such as wintering sage grouse, burrowing owl, mountain plover, prairie dog, loggerhead shrike, pygmy rabbit, antelope, and mule deer.

All wildfires would be suppressed, and controlled prescribed fire would not be used as a management tool. Because fire is controlled and not used as a management tool, habitat would tend to become a similar age class diminishing habitat diversity and beneficial use by native species and migratory birds. Invasive greasewood and sagebrush would continue to become dominant over more important forage plants.

The 350 acres in the Hay Farm Management Unit would continue to be a mix of grasses and tall annual weedy forbs and may gradually convert to a greasewood/sage habitat type.

Alternative 1 Riverine

Existing winter flows provide some ice-free water each year which would continue to benefit the Rocky Mountain population of trumpeter swans, bald eagles, and wintering waterfowl. However, unrestricted public access would continue to negatively impact these species, compromising the open water benefits.

The lack of restrictions on motorized water-based activities could contribute to water quality problems affecting fingerling trout populations. Increased turbidity from boat launching, shoreline angling or motorized watercraft could affect littoral zones and decrease feeding efficiency. However, with visitor use levels as low as they are, the chance of these negative effects occurring are minimal.

Vehicular use of undesignated roads is prohibited under this Alternative, but without full-time enforcement staff monitoring the area, it is doubtful that warning signs would be consistently obeyed. The use of motorized vehicles near the Green River would degrade habitat by increasing river bank erosion, destroying vegetation, disturbing riverine wildlife (waterfowl), disturbing river recreationists, and degrading the viewshed.

Unrestricted visitor uses over time could cause degradation in river bank vegetation that provides cover for fish and wildlife.

Providing rock sills in the Green River provides structure, cover, and beneficial habitat for the fishery. These structures may also improve adjacent wetland/riparian areas by increasing the water table and subsequent water availability to riparian vegetation.

Alternative 1 Invasive Species

The invasion of several nonnative plants is a serious threat to Refuge habitats, especially wet meadows and adjoining riparian areas. Perennial pepperweed, salt cedar, Russian knapweed, and musk thistle are the most troublesome species. Of these, pepperweed is the most widespread and difficult to control. Currently, the only practical method for controlling pepperweed is the use of herbicides. Biological control through the release of beneficial insects is under development; however, its approval is not expected for another ten years. Mechanical control through mowing or grazing can reduce the spread of seed; however, it does little to stress the plant which stores most of its energy underground. Likewise, fire does very little to control the plant. Often it actually benefits the plant by reducing its competition from the surrounding grass and forbs. The other troublesome species are currently found only in isolated patches. They are aggressively controlled through a variety of methods including biological, mechanical, and chemical.

The invasion of this nonnative plant poses an additional problem by providing cover for predators, loss of beneficial wildlife forage and cover, and loss of plant diversity. Under Alternative 1, neither the problems of weed control or reclaiming weed-dominant habitats are well resolved.

Alternative 1 Public Use and Recreation

There is no change in the management of public use and recreation experience at Seedskadee in the short-term. There is potential for increased use as the Refuge becomes more popular. Effects of public use may be evident in increased damage to vegetation, fisheries, water quality, soils and visual quality due to the absence of direction of use, vehicles, boating, and other activities.

Visual quality would remain the same under Alternative 1 but may degrade over time as visitors are accommodated rather than managed. The visual condition of the area has been impacted by off-road uses which have changed or destroyed vegetation. The continued erosion of disturbed riverbanks due to uncontrolled river access may cause runoff and siltation in the river as well as continued damage to existing vegetation. The random creation and continued use of two-tracks fragment habitat, destroy vegetation, increase weed problems, disturb wildlife and visitors, and significantly degrade the viewshed.

The nine mile long wildlife auto-tour route would continue to be seasonal. Pullouts would not be improved along the auto-tour so there would continue to be no unique accommodations for the wildlife photographer. While no designated nature trails are on the Refuge, all areas are open to foot traffic. Upon request, the Refuge staff would continue to provide special activities for youth.

Hunting is a priority public use and would be allowed under all Alternatives. With the hunting population, a positive public relations effect occurs with hunters gaining an appreciation for the Refuge as a resource. Hunting serves as a management tool by assisting in reducing browsers.

The developed Dunkle and Hawley wetland areas are closed to waterfowl hunting resulting in decreased disturbance to trumpeter swans and other waterfowl species using this as fall migrational habitat. However, after managed wetland units freeze up, the only water open for wintering birds is the River. Alternative 1 does not address the need to provide a disturbance free area for wintering waterfowl to rest and feed.

Trapping is allowed by special use permit for management purposes. Predator trapping has a positive effect on nest success.

Under Alternative 1, without a comprehensive fishing and hunting leaflet, the public may continue to be confused about areas open for hunting and Refuge regulations.

The Green River through Seedskadee NWR is open for angling year-round. There is a positive public relations effect with anglers gaining an appreciation for the Refuge as a resource. Young people who fish the Refuge benefit from the “Take a Kid Fishing Day” education programs.

During peak seasons, increased use with boats passing through the Refuge is not monitored or controlled. Unimproved and undesignated parking, boating, and angling access would continue to have an impact on sensitive vegetation.

Although general public camping is prohibited under this Alternative, without enforcement, unauthorized camping occurs. Unregulated and undesignated camping may continue to disturb sensitive wildlife and vegetation. Without monitoring of public use on Refuge resources, it is difficult to quantify the impact of the use on sensitive species.

Educational interpretation would continue to be very minimal and the public would continue to rely on "self guided" tours of the Refuge.

Environmental education would continue to occur on a limited as-requested basis, consisting mainly of tours of the Refuge. No facilities or developed programs exist, and little outreach is dedicated to environmental education. Without an ongoing education program, an understanding and appreciation for wildlife and other natural resources of the Green River basin is not nurtured.

Alternative 1 Cultural Resources

The Refuge would comply with all Federal and State laws and regulations. Little direct protection or stabilization occurs for historic sites. Resource protection would largely be reactive. Any interpretation of Native American history would have a positive effect expanding the public knowledge of the history of the Green River Basin.

Alternative 1 Partnerships

Cooperation with USBR, WYG&F, and BLM would continue on an as-needed basis. Refuge management would conduct ongoing volunteer programs involving student interns, retired persons, and local scout groups. However, recruiting, training, and supervising volunteers would be managed by existing staff and compete against day-to-day responsibilities. The Refuge staff would continue to look for partnering opportunities as needs arise. Staff would participate in the Wyoming Partners for Wildlife Program for habitat improvement on private lands and Partners In Flight Program for improved monitoring and protection of migratory birds. The Refuge would also maintain the lead in the Green River Focus Area of the Intermountain West Joint Venture—a cooperative venture with other Federal agencies and with private landowners in the Green River Basin. The Refuge would continue to participate in other neighboring Federal, State, and local planning processes.

Under Alternative 1, no minority or low income populations would be disproportionately affected by implementation of this Alternative.

Alternative 1 Administrative Management Concerns

The purchase of the remaining five acres would result in Seedskadee NWR owning all lands within their boundary and preclude any land management conflicts with private landowners.

Under Alternative 1, mineral exploration and development would be allowed subject to Refuge approval and stipulations. This approach gives those holding privately-owned minerals reasonable access. It is difficult to determine the extent of potential change to occur (roads, drill pads, or pipeline) if reasonable access were to occur.

Rights-of-way are granted on a case-by-case basis. If a right-of-way were approved, changes would occur in habitat on the right-of-way itself. Potential erosion and soil loss may occur until reclamation is achieved on the right-of-way. Short-term impacts may occur to the fishery depending on means of crossing the Green River.

Domestic livestock trespass would continue to occur largely through water lanes.

Alternative 2 Proposed Action
Alternative 2 Wildlife and Habitat
Alternative 2 Threatened and Endangered Wildlife and Plants

Beneficial effects may likely occur to special status species by providing habitat management and protection, limiting disturbance to individuals, provision of adequate food resources, surveying habitat and habitat quality, and conducting regular monitoring.

Using temporary or permanent closures, or both, to prevent wildlife disturbance or protect sensitive habitats, would benefit a variety of special status species. Regeneration of cottonwoods would be achieved on new sites created by increased water availability providing needed habitat for a number of special status species.

Alternative 2 Wildlife

Increased monitoring of vegetation in all habitat types will improve management decisions for trumpeter swans, grouse, migratory birds, deer, moose, etc. Initiation of population monitoring for grouse will facilitate development of management strategies for upland shrub habitats. Increased knowledge of browsing impacts will improve management of herbivores like deer and moose and support riparian restoration efforts.

Using temporary or permanent closures, or both, to prevent wildlife disturbance or protect sensitive habitats, would benefit a variety of wildlife species, especially trumpeter swans. Reduction in designated open roads will reduce overall disturbance to wildlife and reduce fragmentation of habitats. Seasonal closure of some roads and eventual modification of closed areas will provide much needed resting areas for wintering waterfowl.

Alternative 2 Riparian

Alternative 2 would provide the greatest benefit of any of the Alternatives to the riparian forest, migratory birds, and native wildlife species. Alternative 2 would develop a riparian restoration plan to determine effective methods to establish new age classes of woody plant species and restore the health to the riparian system. Increased and timely water availability would ensure regeneration of cottonwoods and improve the health of existing trees and willows. However, any change in flow regime could also affect optimal power production at Fontenelle. Changes in the prescriptive flow regime could also effect the frequency of flooding at Green River, Wyoming.

Suppressing wildfire and trapping for beaver would protect mature cottonwood forested areas. Maintaining the large diameter trees, snags, and dead trees would provide enhanced breeding, foraging, and migratory habitat for numerous bird species.

By installing wells to monitor groundwater depth and changes in depth, Seedskadee could select the most suitable sites and flows for restoration efforts. Working with Reclamation to establish a flow regime, particularly in years of favorable seed production or drought, may result in an increase of the vigor of existing cottonwood/willow communities and increased riparian regeneration.

Wildlife would be aggressively managed during the restoration phase to reduce populations of species that heavily browse riparian woody plants (deer, moose, and beaver). Exclosures would be constructed in selected areas which would protect regeneration and allow for vegetative recovery. Regularly maintaining livestock trespass fences would result in less livestock trespass and better vegetative growth.

If strategies are successful, a healthier community providing long-term quality habitat may occur over time. Success for migratory birds would be measured through a monitoring program.

Alternative 2 Wetland

In Alternative 2, wetlands would be managed first as migration habitat and habitat for resident species and second as breeding habitat for migratory waterbirds. The Hamp, Hawley, and Pal units would be managed for breeding and migratory habitat. The remaining wetland units would be managed principally as migratory habitat for waterfowl, shorebirds and wading birds. Specifically, the trumpeter swan, Canada goose, numerous species of ducks, the marsh wren, red-winged blackbird, yellow-headed blackbird, tiger salamander, boreal chorus frog, northern leopard frog, mink, and muskrat would benefit from wetland management in Alternative 2.

Periodically drawing down tall emergent vegetation and open water habitat every 5 to 7 years may stimulate natural wet and dry cycles and maintain wetland productivity. Drawing down short emergent vegetation for fall migration concentrates aquatic invertebrates and makes them available to many species of shorebirds. Extensive monitoring of the vegetative recovery and monitoring the kinds and numbers of species using the areas would determine the success of the approach of Alternative 2. The effects of restoring the historic oxbow river channels would be similar to Alternative 1.

Alternative 2 Uplands

Providing a diverse mix of upland desert shrub and grassland habitats could have positive effects for sage grouse, loggerhead shrike, prairie dog, mountain plover, burrowing owl, and pygmy rabbit. Protecting existing stands of tall sagebrush in woody draws from unplanned disturbance may provide crucial thermal cover and foraging areas for winter sage grouse, pygmy rabbit, antelope, and mule deer.

Converting the 350-acre Hay Farm Management Unit to an upland mixed-grass habitat type would benefit grassland species such as western meadowlark, savannah sparrow, vesper sparrow, bobolink, and lark sparrow.

Using small controlled burns as prescribed in Alternative 2 should realize a conversion of small areas of decadent greasewood to an early successional state. This conversion would provide a variety of successional stages across certain upland portions of the Refuge. Using prescribed fire in emergent wetlands would maintain open water and could rejuvenate decadent stands of grasses and other vegetation. Restricting the use of fire in floodplain forest habitats would protect existing stands of cottonwoods that are in poor vigor and not reproducing.

Implementing minor upland treatments could result in more vigorous and diverse upland habitats and, therefore, enhance habitat for resident and migratory species. Invoking long-term monitoring will measure the effects of various treatments.

Alternative 2 Riverine

Similar to Alternative 1; however, negative effects to the riverine habitat should diminish. Providing open water (ice-free) habitat in the River channel, sufficient aquatic vegetation, and exploring temporary closures may benefit wintering trumpeter swans, waterfowl, and bald eagles.

Closer coordination between managing agencies may also lead to positive effects to the fishery providing better recreational fishing and a food source for migratory birds such as white pelicans, bald eagles, herons, egrets, and cormorants. An improved public education and awareness campaign about river management may help to build support and understanding for management actions. Monitoring winter use by wildlife and visitors, including human-wildlife interactions will be important to evaluate the effectiveness of management strategies. Evaluation of changes to fisheries and aquatic vegetation from changes in flows will also be key factors to measuring the success of various flow strategies.

Alternative 2 Invasive Species

Decreasing the Refuge's dependence on chemical control of weedy plants may have a positive impact on wildlife. However, chemical control is generally the only effective method available for many species and the decrease in control may increase the spread of certain weeds. Developing partnerships with Reclamation and BLM may have positive effects by decreasing the encroachment of salt cedar and pepperweed from adjacent lands.

Alternative 2 Public Use and Recreation

Alternative 2 Recreation

The direct effects to the public use and recreation experience would be changes in development and level of control which may or may not be acceptable to those that currently use the Refuge. There would be the potential for enhancement of habitats, water quality, fisheries, and visual quality caused by the River access improvements and the restriction on Refuge access.

The closure of non-designated two tracks, the overall reduction in roads open for public travel, and the control of public access to the River would improve the areas' natural appearance and the solitude experienced by visitors. Modifications to conduct or improve public use opportunities such as hardening roads and ramps, and development of trails, interpretive information, and other amenities would be minor intrusions to the landscape that would not substantially detract from the larger natural setting.

Maintaining the nine mile wildlife auto-tour route would ensure year-round access for visitors. Enhancing pullouts along the auto-tour would provide new wildlife viewing and photography opportunities. The construction of one nature trail in a riparian area would expose a larger spectrum of people (various ages and abilities) to major habitats within the Refuge. Expanding special activities for youth would provide a greater opportunity to nurture an understanding of and an appreciation for wildlife and other resources.

Under Alternative 2, a new winter closed area would be established via a separate public process. The future closure would address the current lack of sanctuary for wintering birds. The seasonal road closure proposed in this Alternative partially addresses the needs of wintering wildlife. With the hunting population, there is a positive public relations effect with hunters gaining an appreciation for the Refuge as a resource. Hunting also serves as a management tool by assisting in reducing browse. Young people who hunt the Refuge benefit from the safety and courtesy of education programs. Species may benefit with management regulations. Increased law enforcement patrols may increase compliance. People with disabilities would be provided opportunities to participate.

The effects from sport fishing opportunities are similar to Alternative 1; however, Alternative 2 may entice more people to visit. Providing designated roads which are well signed in the field and mapped on the travel brochure will reduce destruction to vegetation and sensitive habitats.

Restricting and eventually reducing the number and allocation of commercial use permits to specific outfitters may add stability to the fishing program. The limitations set on commercial use and reaches available for guided use in Alternative 2 may improve the quality of the recreation experience but increase demand for permits. Commercial scenic/wildlife viewing floats may become popular in the future. With limits on permits and river use segments, non-commercial floaters/anglers may feel their experienced is enhanced.

Without additional enforcement, unauthorized camping and off-road travel may continue to disturb sensitive wildlife and vegetation. Monitoring of public use on Refuge resources, would help reduce the potential impact of these uses on sensitive species.

The development of a comprehensive fishing and hunting leaflet would enhance the visitor experience and the increased law enforcement patrols should realize beneficial effect from more compliance. The monitoring of public use of Refuge resources would add greater protections.

The increased environmental interpretation efforts would have a positive effect informing visitors of the importance of plants and wildlife relative to the human history of the area. The river and riparian interpretive trail and interpretive panels at pullouts along the auto-tour would improve the quality of the educational experience on the Refuge.

The improved environmental education and public information programs would enhance a visitors appreciation and understanding of the Refuge, wildlife, and history.

Clustering facility development in the northwest quadrant of the Refuge directs public use and keeps the remaining portion of the Refuge in a semi-primitive state. This would have a positive effect on vegetation, wildlife, and visual quality resources.

Alternative 2 Cultural Resources

The effects would be similar to Alternative 1; however, the approach would largely be proactive. Significant cultural resources (historic and prehistoric) would be preserved and protected from inadvertent damage that could occur as a result of Refuge undertakings. A positive effect would be realized because significant cultural resources would be recorded and avoided. Maintaining the character of the historic viewshed of the Oregon and Mormon National Historic Trail would ensure the historic visual quality of the area.

Alternative 2 Partnerships

New opportunities for partnerships are developed that may result in promoting and sustaining the development and management of the Refuge. Providing room and board for volunteers while working at the Refuge would encourage more people with diverse backgrounds to volunteer at the Refuge and provide a higher quality volunteer experience and probably a more productive program. Management would assume a leadership role with government officials on issues relating to wildlife and habitat management. This may improve the understanding of the Service's mission, the mission and goals of the Refuge System, and the purpose and goals of Seedskadee NWR.

Under Alternative 2, no minority or low income populations would be disproportionately affected by implementation of this Alternative.

Alternative 2 Administrative Management Concerns

Alternative 2 would provide an opportunity for acquisition of additional land if warranted for management of selected species or for mitigation purposes. This approach ensures that the Refuge would be able to meet their purpose and address unknown future needs. However, if new lands were acquired, impacts would occur on budgets and management.

Under Alternative 2, mineral exploration and development would be similar to Alternative 1; however, no surface occupancy would be allowed for access to privately-owned minerals if they could be otherwise accessed.

Similar to Alternative 1; however, Alternative 2 requires that any ROW granted would be restricted to an existing utility corridor which consolidates any visual or vegetative disturbances that may occur.

Livestock trespass would be reduced. Livestock and public use conflicts would be reduced.

Alternative 3
Alternative 3 Wildlife and Habitat
Alternative 3 Threatened and Endangered Wildlife and Plants

Similar to Alternative 2; however, additional benefits as a result of reduced roads, reduced hunting pressure, and the elimination of commercial use. All of the above result in overall reduced disturbance to wildlife and decreased fragmentation of habitats.

Alternative 3 Wildlife

Similar to Alternative 2. Elimination of sage grouse, snipe, rail, and mourning dove hunts directly benefit these species and reduces overall hunting disturbance to all wildlife species. Reduction in length of the waterfowl hunt season will increase the availability of wintering resting/feeding areas for all wintering waterbirds. Areas hunted off-refuge may see increased hunting success as the Refuge sanctuary area may invite birds to remain in the local area.

Reduced roads, reduced hunting pressure, and the elimination of commercial use will reduce overall disturbance to wildlife and decrease fragmentation of habitats.

Alternative 3 Riparian

Similar to Alternative 2. Reduced fragmentation and disturbance as a result of decreased roads.

Alternative 3 Wetland

Similar to Alternative 2.

Alternative 3 Uplands

Similar to Alternative 2. Reduced fragmentation and disturbance as a result of decreased roads.

Alternative 3 Riverine

Similar to Alternative 2. Visitor use would decrease with the elimination of commercial/guided use of the River through the Refuge and overall reduction in roads open to public travel. This may result in reduced public use and subsequently reduce disturbance and damage to sensitive vegetation/wildlife inhabiting the river corridor.

Alternative 3 Invasive Species

Similar to Alternative 2.

Alternative 3 Public Use and Recreation

Alternative 3 Recreation

The effects of public use and recreation would be similar to Alternative 1. The elimination of commercial guided fishing or guided scenic tours, the prohibition of motorized watercraft, reduction in some hunting opportunities, and reduced public roads may displace guides, visitors, and motorized uses to other recreation destinations within the larger recreational region. The results of this change may be a reduction in the amount of angling, hunting, wildlife viewing, and in general, Refuge visitation. It may have a positive effect by providing a quieter recreational experience for non-commercial anglers and visitors as well as decreasing disturbance to wildlife and vegetation. Non-commercial anglers would not have to compete for launch sites, parking, or angling opportunities.

Alternative 3 Cultural Resources

Alternative 3 effects would be the similar to Alternative 1. The Refuge would continue to comply with all Federal and State laws and regulations. No new facilities would be built under Alternative 3, and resource protection would be reactive.

Alternative 3 Partnerships

Partnership opportunities would be similar to Alternative 2. Under Alternative 3, no minority or low income populations would be disproportionately affected by implementation of this Alternative.

Alternative 3 Administrative Management Concerns

Similar to Alternative 2; however, no opportunity to dispose of lands. Alternative 3 does not provide access to privately-owned minerals and assumes that they would be accessed from outside the boundary of the Refuge. If no surface occupancy were successfully applied, there would not be the potential for surface disturbance for extraction of privately-owned minerals.

Providing off-site watering would allow the closure of existing water gaps. The potential effects for livestock trespass would be further reduced and the efforts to enforce trespass would be minimal.

Table 2. Effects Matrix Comparison of Environmental Consequences

Issue Questions	Alternative 1 - No Action	Alternative 2 - Preferred Alternative	Alternative 3
Threatened and Endangered Wildlife and Plant What measures are taken to protect threatened, endangered, and candidate species and species of management concern?	Beneficial effects from habitat protection, limiting disturbance to individuals, provision of adequate food resources and limited population monitoring. Sensitive species dependent upon riparian shrub communities and riparian forest may experience degradation. No assurance that the riparian forest along the Green River would be preserved. Vegetation and riparian impacts from livestock, uncontrolled visitor access, and boat launching may continue.	Beneficial effects from habitat management and protection, limiting disturbance to individuals, provision of adequate food resources, surveying habitat and habitat quality. Regular monitoring of threatened, endangered, and candidate wildlife and plant species and wildlife species of management concern will increase their protection. Wintering waterfowl and trumpeter swans continue to benefit. Using temporary or permanent closures or both to prevent wildlife disturbance benefit all species of concern. Regeneration of cottonwoods achieved on new sites.	Same as Alternative 2. Except trumpeter swans may decrease use of the area for breeding if management is not directed towards this species.

Table 2. Effects Matrix Comparison of Environmental Consequences

Issue Questions	Alternative 1 - No Action	Alternative 2 - Preferred Alternative	Alternative 3
Wildlife What measures are taken to protect and manage native wildlife?	Management of existing wetlands and development of additional wetlands benefits trumpeter swans and numerous other wetland dependent species. Management of winter flows to maintain ice free waters will continue to benefit a variety of wintering bird and aquatic species. Lack of vegetative monitoring makes evaluation of management strategies difficult. Enhancement of portions of the riparian corridor would benefit a variety of avian and mammal species; however, riparian restoration efforts may be jeopardized without proper management of herbivores. Protection without active management of upland habitats may eventually result in degraded habitat conditions for the sage grouse and other upland species. Lack of monitoring in upland habitats for grouse and other species makes management programs difficult to develop and eventually evaluate. Current impacts from invasive species, uncontrolled visitor access, and the lack of public use monitoring may continue to impact all habitat types, thus reducing the quality of potential habitat for all wildlife and plant species.	Increased monitoring of vegetation in all habitat types will improve management decisions for trumpeter swans, grouse, migratory birds, deer, moose, etc. Initiation of population monitoring for grouse will facilitate development of management strategies for upland shrub habitats. Increased knowledge of browsing impacts will improve management of herbivores like deer and moose and support riparian restoration efforts. Reduction in designated open roads will reduce overall disturbance to wildlife and reduce fragmentation of habitats. Seasonal closure of some roads and eventual modification of closed areas will provided much needed resting areas for wintering waterfowl and may increase hunting success by holding waterfowl in the local area.	Similar to Alternative 2. Elimination of sage grouse, snipe, rail, and mourning dove hunts directly benefit these species and reduces overall hunting disturbance to all wildlife species. Reduction in length of the waterfowl hunt season will increase the availability of wintering resting/feeding areas for all wintering waterbirds. Areas hunted off-refuge may see increased hunting success as the refuge sanctuary area may invite birds to remain in the local area. Reduced roads, reduced hunting pressure, and the elimination of commercial use will reduce overall disturbance to wildlife and decrease fragmentation of habitats.

Table 2. Effects Matrix Comparison of Environmental Consequences

Issue Questions	Alternative 1 - No Action	Alternative 2 - Preferred Alternative	Alternative 3
Riparian How will riparian habitat losses be mitigated to support migratory birds and native wildlife species? A3. Issue: How will riparian habitats be managed to support migratory birds?	Negative effects to the riparian habitat from channelizing, lower peak flows and timing changes in restricted flows, and ice scouring. Riparian forest continue to age, be in poor health compared with the upstream forest above Fontenelle Reservoir; be simpler in structure and have insufficient regeneration to establish new age classes and may continue to be highly vulnerable.	Alternative 2 provides the greatest benefit of the alternatives to the riparian forest, migratory birds, and native wildlife species. Increased and timely water availability, and increased habitat and wildlife management would ensure protection and regeneration of cottonwoods and a healthier community will improve the health of existing trees and willows.	Same as Alternative 2.
	Degradation of riparian forests impacts migratory bird species. Planting of understory woody shrub would increase the shrub cover for wildlife and migratory birds. Riparian habitat may continue to be negatively effected by the insufficient control of browsers.	Change in flow regime may have negative effects on power production at Fontenelle and the frequency of flooding at Green River, Wyoming. Maintaining the large diameter trees, snags and dead trees would enhance breeding habitat and benefits raptors, great blue herons and cavity nesters and enhance foraging availability.	Same as Alternative 2.
Wetlands How will wetland losses be mitigated to support migratory birds and native wildlife species? How will wetlands be managed to support migratory birds and native wildlife species? How are predators and nuisance species controlled?	Benefit migratory and breeding habitat for waterfowl, shorebirds, and wading birds. Moderate negative effects from weeds and predators and nuisance in nesting areas continue. With limited wildlife and waterfowl production monitoring, the degree of success unmeasured. Restoring historic oxbow river channels may provide additional spring migration, breeding, or fall migration habitats.	Benefits migratory and breeding habitat for waterfowl, shorebirds and wading birds. Periodically drawing down tall emergent vegetation and open water habitat may maintain wetland productivity. Drawing down short emergent vegetation for fall migration may have a positive effect on shorebirds, wading birds, and dabblers. Extensive monitoring of the vegetative recovery and the kinds and numbers of species using the areas would occur to measure management effectiveness.	Same as Alternative 2.

Table 2. Effects Matrix Comparison of Environmental Consequences

Issue Questions	Alternative 1 - No Action	Alternative 2 - Preferred Alternative	Alternative 3
Upland How would upland shrub and grassland habitat be managed to support native wildlife species and migrating birds?	The Dry Creek Unit which is fenced and free of grazing by domestic livestock has resulted in an upland system closer to approximation of natural conditions (prior to introduction of grazing in the last century) than anywhere else in the immediate region. This system should be vital to and supporting of native wildlife species and migratory birds. Habitat may tend to become a similar age class diminishing habitat diversity and beneficial use by native species and migratory birds. Invasive greasewood and sagebrush would continue to become dominant over more important forage plants.	Providing a diverse mix of upland desert shrub and grassland habitat and increased protection of this habitat may have positive effects for wildlife. Protecting existing stands of tall sagebrush in woody draws from unplanned disturbance may provide crucial thermal cover and foraging areas for winter sage grouse, pygmy rabbit, antelope, and mule deer. Converting the Hay Farm Management Unit to a upland mixed grass habitat type would benefit grassland species.	Same as Alternative 2.
	The 350 acres in the Hay Farm Management Unit would remain as a mix of grasses and annual weedy forbs.	Using small controlled burns should realize a conversion of greasewood stands to an early successional state providing a variety of successional stages. Using prescribed fire in emergent wetlands would maintain open water and could rejuvenate decadent stands of grasses and other vegetation.	Same as Alternative 2.
		Restricting the use of fire in floodplain forest habitats may have a positive effect on cottonwoods. Management of uplands should result in a greater variety of upland habitats available for native wildlife species and migratory birds. Long-term monitoring should show the measure of success.	Same as Alternative 2.

Table 2. Effects Matrix Comparison of Environmental Consequences

Issue Questions	Alternative 1 - No Action	Alternative 2 - Preferred Alternative	Alternative 3
Riverine How are fisheries managed on the Refuge	Ice-free water continues to benefit the tri-state population of trumpeter swans, bald eagles, and wintering waterfowl. Minimal negative effects to littoral zones. Rock sills provide beneficial habitat for fishery.	Similar to Alternative 1; however, overall negative effects to the fishery should diminish. Implementing a minimum 500 cfs winter flow would ensure open water is available in winter for wintering fish and wildlife. Monitoring wildlife, visitor use, and population trends in roundtail chubs, flannel-mouth suckers, and trout would evaluate management effectiveness.	Same as Alternative 2.
Weeds To what extent are weeds (invasive, nonnative plants) controlled?	The invasion of several nonnative plants continues to threaten wet meadows and adjoining riparian areas. Weeds provide cover for predators, and there is a loss of beneficial forage, cover and plant diversity. Under Alternative 1 weed control is addressed at a basic maintenance level and large stands are not reduced and restoration of weed-dominant habitats would not occur.	Attempts to decrease the Refuge's dependence on chemical control of weedy plants may have a positive impact on wildlife. However, it may increase the spread of certain weeds. Developing partnerships may have a positive effect by decreasing the encroachment of salt cedar from adjacent lands.	Negative effects could occur from the continued spread of noxious weeds in the Refuge and the spread of salt cedar from adjacent lands. Weeds may continue to compete with more desirable wildlife cover and forage.

Table 2. Effects Matrix Comparison of Environmental Consequences

Issue Questions	Alternative 1 - No Action	Alternative 2 - Preferred Alternative	Alternative 3
Public Use and Recreation	No change in public use and recreation experience in the short-term. Effects of use may be evident in increased damage to vegetation, fisheries, water quality, soils, and visual quality. These impacts would result from a reduced emphasis to control human use, vehicles, boat launch sites, and lack of site planning for future facilities.	Changes in recreation experience occur. River access improvements enhance habitats, water quality, fisheries, and visual quality. Modifications to conduct or improve public use opportunities such as hardening roads, reducing roads, improving ramps, and development of trails, interpretive information, and other amenities would not substantially detract from the larger natural setting.	The effects of public use and recreation would be similar to Alternative 1. Some recreation and public uses (guided trips, hunting of select species) are displaced to other recreation destinations within the larger recreational region. May be a reduction in the amount of angling, hunting, wildlife viewing and in general, the displacement of visitors. Positive effects are a quieter recreational experience for non-commercial anglers and visitors as well as decreasing disturbance to wildlife and vegetation. Non-commercial anglers would not have to compete for launch sites, parking or angler opportunities.
Wildlife Viewing and Photography To what extent are opportunities provided for wildlife viewing and photography?	The majority of roads including the auto-tour route would continue to be seasonally impassible. No unique accommodations for the wildlife photographer.	Wildlife auto-tour route accessible year-round. New wildlife viewing and photography opportunities provided via pullouts. Greater exposure for a larger spectrum of people to habits within the Refuge.	Similar to Alternative 1; however, the reduced number of roads may reduce viewing/ photography opportunities for individuals which do not hike and improve opportunities for others due to less disturbance by vehicles.

Table 2. Effects Matrix Comparison of Environmental Consequences

Issue Questions	Alternative 1 - No Action	Alternative 2 - Preferred Alternative	Alternative 3
Hunting What types of hunting opportunities are provided on the Refuge? Recreational Trapping. What types of recreational trapping are allowed on the Refuge? Sport Fishing What types of sport fishing opportunities are provided on the Refuge?	With the hunting and angling populations there is a positive public relations effect as they gain an appreciation for the refuge as a resource. Some benefit to nesting waterfowl from predator trapping. Improved angler opportunities for non-commercial anglers as commercial use is reduced via attrition.	Creation of a new closed area via a separate public process may improve waterfowl hunting opportunities but limit some winter fishing and floating opportunities. All winter wildlife would benefit from a new type of closed area which includes the river. Establishment of new closed area may improve hunting opportunities by attracting birds onto the Refuge and maintaining local populations. People with disabilities would be provided opportunities to participate in hunting/angling. Improved trapping operations would benefit ground nesting species. Improved angler opportunities for non-commercial anglers as commercial use is reduced via attrition.	Similar to Alternative 2; however, hunting opportunities for select species would be reduced. Establishment of new closed area similar to Alternative 2. Fishing opportunities would be decreased without commercial operations. This may limit accessibility of anglers with disabilities and improve opportunities for non-commercial users. Trapping opportunities similar to Alternative 2.
Commercial Guide Fishing/ Floating Is commercial guide fishing/ floating allowed and how is it managed? Camping Is camping allowed, and if so, where and how are sites developed and the use managed? Boating Is boating allowed on the River through the Refuge?	There is a slow reduction in commercial guide fishing /floating as permits are reduced via attrition to four or less. Unimproved and undesignated parking, boating, and angling access, and unauthorized camping would continue to have an impact on sensitive vegetation and wildlife. Without a comprehensive fishing and hunting leaflet, the public may continue to be confused about areas open for hunting and special regulations for fishing. The visual condition has been impacted and continued damage to existing vegetation from off-road vehicle use and dispersed public use would continue. Camping is not permitted and is diverted to other off-refuge sites.	Restricting and standardizing the number of permits for commercial use may add stability to the fishing program, and provide a better experience and more protection for the resource. However, the limitations set on commercial use may improve the quality of the recreation experience but increase demand for permits. The development of a comprehensive fishing and hunting leaflet would enhance the visitor experience and the increased law enforcement patrols should realize beneficial effects from more compliance. Camping is not permitted and is diverted to other off-refuge sites.	Commercial guides and uses would be displaced to other recreation destinations within the larger recreational region. Displacement of commercial visitors and reduction of angling, wildlife viewing may occur providing a quieter recreational experience for non-commercial visitors as well as decreasing disturbance to wildlife and vegetation. May decrease opportunities for persons with disabilities to recreate. The development of a comprehensive fishing and hunting leaflet similar to Alternative 2. Camping is not permitted and is diverted to other off-refuge sites.

Table 2. Effects Matrix Comparison of Environmental Consequences

Issue Questions	Alternative 1 - No Action	Alternative 2 - Preferred Alternative	Alternative 3
	Barring motorized craft would reduce impacts to habitats and wildlife.	Creating a no-wake zone would reduce disturbances to habitats and wildlife.	Same as Alternative 1 - Barring motorized craft would reduce impacts to habitats and wildlife.
Visitor Use Level What is the appropriate visitor use level of the Refuge?	Without monitoring of public use on refuge resources, it is difficult to quantify the impact of the use on sensitive species. Disturbances to wildlife may continue at inappropriate levels and visitor experiences may diminish without monitoring.	The monitoring of general public use of refuge resources would guide future use levels on the refuge so the purpose and mission of the refuge is not compromised and the overall visitor experience is protected.	Same as Alternative 2.
Access Management How is access/travel managed on the Refuge? River Access How is river access managed? Universal Access To what extent is universal access to public use facilities and activities provided?	Current impacts from uncontrolled visitor access and boat launching may continue to impact sensitive vegetation and riparian areas. New roads continue to be established. Additional signs and updated brochures may assist the visitor and protect habitats. Additional law enforcement patrol may minimize access conflicts. There are no new universally accessible opportunities.	Visitor access, vehicles and boat launching is controlled having a positive effect on vegetation, wildlife, visual resources, and the visitor experience. Existing boat launch facilities are enhanced. Opportunities for universal access and experiences are expanded. Reduction in roads may limit some direct access to River by vehicles. All areas remain open to foot travel.	Similar to Alternative 2; however, with further reduction in roads, the elimination of commercial users, and prohibited use of motorized boats, impacts to wildlife and their habitat could be reduced. Similar to Alternative 1; no new universally accessible opportunities. Direct access opportunities by vehicle to certain parts of the Refuge are reduced. All areas remain open to foot travel.

Table 2. Effects Matrix Comparison of Environmental Consequences

Issue Questions	Alternative 1 - No Action	Alternative 2 - Preferred Alternative	Alternative 3
Environmental Interpretation and Education *Environmental Interpretation* To what extent are opportunities pursued to interpret natural resources, especially wildlife and their habitat for the visiting public? *Environmental Education.* What type of environmental education program is provided to the public?	Educational interpretation would continue to rely on "self guided" tours of the Refuge. Without an ongoing education program, an understanding of and appreciation for wildlife and other natural resources of the Green River basin is not nurtured.	Positive effect from informing visitors of the importance of plants and wildlife in the human history of the area. The quality of the educational experience on the refuge improves with the interpretive trails and panels along the auto-tour. Visitors gain a greater appreciation and understanding of the refuge, wildlife, and people's role in the environment with addition of a visitor/education center.	Same as Alternative 1.
Resource Protection *Public Information* How is information on the Refuge, its resources and regulations provided and what are the effects?	Communication informal. Hunters, anglers, wildlife viewers, and the youth would benefit most from available information. Location of facilities and use determined by where the use is occurring.	Clustering public use facilities benefits vegetation, wildlife, visual resources and management. Improved brochures and availability of information should reduce impacts to resources. Overall reduction in open roads and increased law enforcement improves communication of Refuge regulations and protects resources and visitor safety. Improved directional signing would also reduce impacts.	Similar to Alternative 2; however, greater protection afforded by reducing roads and eliminating commercial use.
Cultural Resources How are cultural resources protected? To what extent are opportunities pursued to interpret cultural resources for the visiting public?	Little direct protection or stabilization occurs for historic sites. Resource protection would largely be reactive. Any interpretation of Native American history would have a positive effect expanding the public knowledge of the history of the Green River Basin.	The effects would be similar to Alternative 1; however, the approach would be proactive. Significant cultural resources (historic and prehistoric) would be preserved and protected. A positive effect from recording and avoiding cultural resources. The character of the historic viewshed maintained. Addition of a trail at Lombard Ferry may improve the visitor experience and increase use of area. Additional visitation may disturb wildlife. Monitoring use will assist management of site.	Same as Alternative 1.

Table 2. Effects Matrix Comparison of Environmental Consequences

Issue Questions	Alternative 1 - No Action	Alternative 2 - Preferred Alternative	Alternative 3
Partnership To what extent are partnership opportunities pursued with volunteers, local service groups, organizations, individuals, schools, and other governmental agencies?	Partnerships and volunteer programs continue on an as-needed permits basis. Recruiting, training, and supervising volunteers would be managed by existing staff and compete against day-to-day responsibilities.	Partnership and volunteer programs are more developed and result in a higher quality experience and improved understanding of the Service's mission, the mission and goals of the refuge system and the purpose and goals of Seedskadee NWR.	Same as Alternative 2.
Administrative Management Concerns Land Acquisition. Is further land acquisition or land disposal planned?	The purchase of the remaining 5 acres would result in Seedskadee NWR owning all lands within their boundary and preclude any land management conflicts with private landowners.	Similar to Alternative 1 and ensures that the Refuge would be able to meet their purpose and address unknown future needs. However, if new lands were acquired, there would be impacts on budgets and management.	Same as Alternative 2.
Minerals How will privately-owned minerals be developed?	Under Alternative 1 mineral exploration and development may occur. It is difficult to determine the extent of potential change to occur (roads, drill pads or pipeline) if reasonable access were to occur.	Under Alternative 2, mineral exploration and development would be similar to Alternative 1; however, no surface occupancy would be allowed if they could be otherwise accessed. Impacts unknown.	If no surface occupancy were successfully applied, there would not be the potential for surface disturbance for extraction of privately owned minerals.
Right-of-Way What is the Refuge's policy toward requests for grants of ROW across the Refuge?	If a right-of-way were approved, there would be changes in habitat on the right-of-way itself. Potential erosion and soil loss may occur until reclamation is achieved on the right-of-way. Short-term impacts may occur to the fishery depending on means of crossing the Green River.	Alternative 2 requires that any ROW granted would be compatible with refuge purposes and if allowed restricted to an existing utility corridor which consolidates any visual or vegetative disturbances that may occur.	Same as Alternative 2.

Table 2. Effects Matrix Comparison of Environmental Consequences

Issue Questions	Alternative 1 - No Action	Alternative 2 - Preferred Alternative	Alternative 3
Livestock Access How is access to water for livestock provided? Grazing Is grazing allowed on the Refuge? What is the Refuge doing to prevent livestock trespass?	Refuge provides 14 access lanes for livestock. Domestic livestock trespass would continue to occur largely through water lanes. There are no changes in the grazing policies.	Refuge provides 14 access lanes for livestock. Livestock trespass would be reduced. Grazing not permitted.	Effects from livestock trespass would be further reduced and the efforts to enforce trespass no longer required. Grazing not permitted.

Chapter 5. List of Preparers

The list of preparers is found in Appendix I.

Chapter 6. CCP Goals and Objectives

Chapter 6 of the EA incorporates by reference Chapter 4 - Refuge Goals and Objectives - of the CCP.