

**South Dakota Bald Eagle (*Haliaeetus leucocephalus*)
Management Plan**



**South Dakota Game Fish and Parks
Pierre, SD
2005**

Wildlife Division Report Number No. 2005-01

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Management Plan**

Approved/Date _____
Secretary, Department of Game, Fish and Parks

DISCLAIMER

This is the completed South Dakota Bald Eagle Management Plan. It does not necessarily represent the views nor the official position or approval of any individuals or agencies involved in the plan formulation, other than South Dakota Game, Fish and Parks.

ACKNOWLEDGEMENTS

This plan was developed in cooperation with the US Fish and Wildlife Service (USFWS), the National Park Service (NPS), the US Army Corps of Engineers (USACE), NE Game and Parks Commission (NE G&P), Standing Rock Sioux Tribe, Lower Brule Tribe, Flandreau Santee Sioux Tribe, Rosebud Sioux Tribe, Sisseton-Wahpeton Sioux Tribe, Oglala Sioux Tribe, Cheyenne River Sioux Tribe, and Yankton Sioux Tribe.

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Front Cover Photograph: Doug Backlund

EXECUTIVE SUMMARY

The number of bald eagles in South Dakota has increased dramatically since the species was first identified for federal protection in 1940. With this increase, South Dakota Game, Fish and Parks (SDGFP) is taking a proactive position regarding eagle management to ensure that the species continues to thrive in the state. This bald eagle management plan identifies long-term goals for bald eagles in South Dakota and management actions designed to achieve those goals. A summary of goals and management actions that SDGFP has developed for the bald eagle in South Dakota follows.

Bald Eagle Management Goals

Nesting Bald Eagles:

- Achieve an average of 25 active (in use at some point during the nesting season) bald eagle nests per year, with a five-year running average.

Wintering Bald Eagles:

- Maintain known bald eagle winter roost sites (below Oahe Dam, Fort Randall Dam and Gavins Point Dam) with no-net-loss in acreage of cottonwood forest cover.

Bald Eagle Management Actions

Monitoring:

- Coordinate monitoring of bald eagle nests statewide annually to determine the number of active nests and the number of nests that produce fledglings. Monitoring will continue for ten years post delisting.
- Continue to participate in the annual Midwinter Bald Eagle Survey.
- Survey known winter roost areas below Oahe Dam, Fort Randall Dam, and Gavins Point Dam at least three times per winter (biologists from Karl Mundt Refuge will continue to monitor the roost at Fort Randall Dam).

Buffers and Use Restrictions:

- Maintain a 1/2-mile buffer zone around active bald eagle nests during the nesting season on SDGFP managed lands (February-August).
- Prohibit construction within 1/4 mile of a winter roost site during the time that it is occupied on state managed lands (October/November through March/April).
- Continue to close winter roosts to vehicular traffic during the winter months
 - Oahe Downstream Recreation Area - Closed November 1-March 31
 - Randall Creek Recreation Area-Closed October 1-April 30
 - Chief White Crane Recreation Area (below Gavins Point Dam)-Closed November 1 through March 31

Cottonwood Regeneration

- Plant a 4:1 replacement ratio of four cottonwood seedlings for any mature tree removed along the Missouri River in SDGFP-owned areas.

- Develop a planting schedule to retain the currently existing cottonwood acreage at winter roost sites; downstream of Oahe, Fort Randall, and Gavins Point dams.
- Identify and initiate planting at potential sites where cottonwoods can be regenerated on the transferred lands at reasonable expense.

Landowner Outreach

- Coordinate with other agencies and non-profit organizations to assist landowners who want to develop conservation plans for bald eagles.

Public Education

- Continue to promote bald eagle programs to involve and educate the public.
- Provide information to assist landowners and resource agencies in reducing disturbances to bald eagles.

ACRONYMS

APLIC	Avian Power Line Interaction Committee
BGEPA	Bald and Golden Eagle Protection Act
BO	Biological Opinion
CFS	Cubic Feet per Second
ESA	Endangered Species Act
MOA	Memorandum of Agreement
msl	mean sea level
NE G&P	Nebraska Game and Parks Commission
NPS	National Park Service
NRCS	Natural Resources Conservation Service
SDGFP	South Dakota Game, Fish and Parks
SDSU	South Dakota State University
USACE	U.S. Army Corps of Engineers
USFWS	US Fish and Wildlife Service
WCO	SDGFP Wildlife Conservation Officer

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1 INTRODUCTION

In the last thirty years, the bald eagle (*Haliaeetus leucocephalus*) has made a remarkable recovery. Considered close to extinction in the lower 48 states for many years, the population has recovered to such an extent that the US Fish and Wildlife Service (USFWS) is considering removing the species from the threatened species list. Like other states across the nation, South Dakota has seen a dramatic increase in bald eagle numbers, with bald eagles now occupying the state year-round.

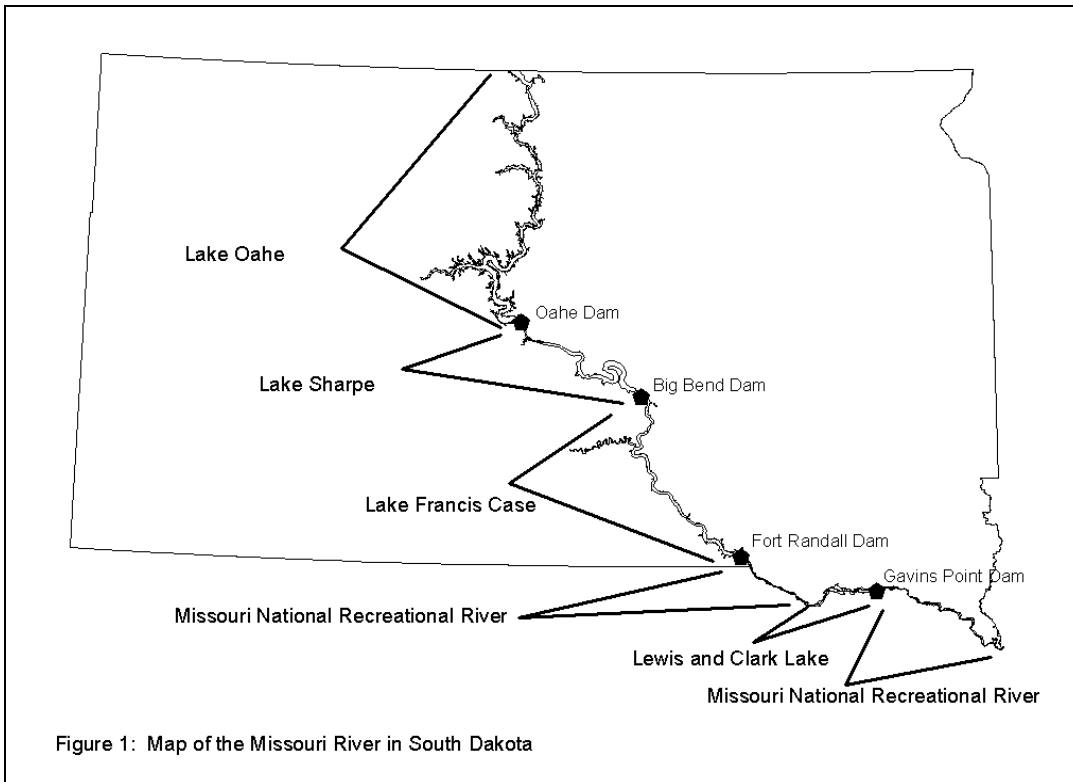
In this plan, South Dakota commits to on-going protection and management of the bald eagle throughout the state. The plan is intended to be a flexible "living" document that will help managers make decisions to promote continued recovery of bald eagles. As we learn more about the species and its habitat, the approaches we take to management may change to reflect this new knowledge (adaptive management).

South Dakota Game, Fish and Parks (SDGFP) developed this plan in coordination with US Fish and Wildlife Service (USFWS), National Park Service (NPS), US Army Corps of Engineers (USACE), Standing Rock Sioux Tribe, Lower Brule Tribe, Flandreau Santee Sioux Tribe, Rosebud Sioux Tribe, Sisseton-Wahpeton Sioux Tribe, Oglala Sioux Tribe, Cheyenne River Sioux Tribe, and Yankton Sioux Tribe as well as with input from the public sector. Goals were developed with the help of experts in bald eagles as well as in habitat management. The commitments described here are only for South Dakota Game, Fish and Parks projects and cooperators, where identified. SDGFP encourages other entities to make similar commitments to protect bald eagles and their habitat.

1.1 Purpose and Need

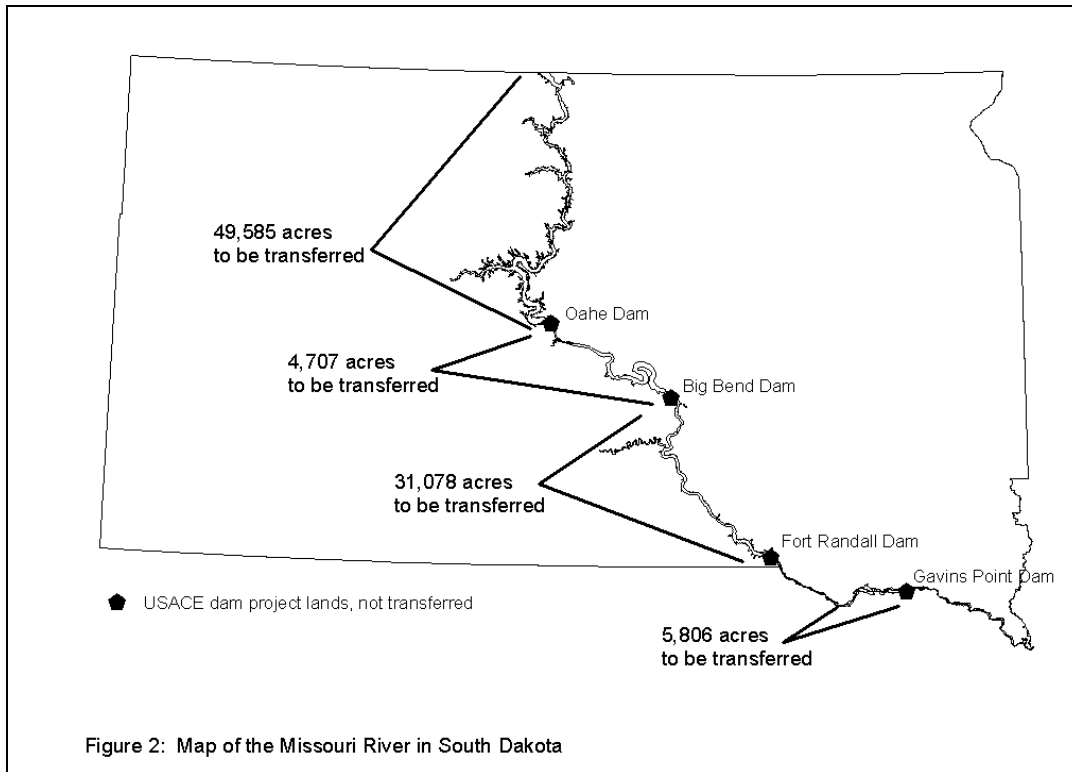
1.1.1 Federal Land Transfer

There are six major dams on the Missouri River, four of which are in South Dakota; Oahe, which creates Lake Oahe; Big Bend, which creates Lake Sharpe; Fort Randall, which creates Lake Francis Case; and Gavins Point, which creates Lewis and Clark Lake (Figure 1). The resulting reservoirs are flanked by lands that the federal government appropriated to allow for dam construction and reservoir filling. The USACE was given jurisdiction over these lands. The Water Resources Development Act of 1999 (Public Law 106-53, August 17, 1999) required the USACE to transfer lands and recreation areas at Lake Oahe, Lake Sharpe, Lewis and Clark Lake, and Lake Francis Case to South Dakota, the Cheyenne River Sioux Tribe, and the Lower Brule Sioux Tribe. This transfer may eventually include a total of 91,178 acres to the State of South Dakota: 49,585 acres along Lake Oahe region, 4,709 acres along Lake Sharpe, 31,078 acres along Lake Francis Case, and 5,806 acres along Lewis and Clark Lake (Figure 2). To date (2005), only the recreation areas have been transferred to the state. This



includes 12,375 acres that have been transferred and 1,659 acres currently leased to the state.

Once the lands are transferred to South Dakota, state environmental laws apply (USACE 2001). To ensure that federally threatened and endangered species continue to be protected, SDGFP, the USFWS, and the USACE entered into a Memorandum of Agreement (MOA) in 2001. The National Park Service (NPS), which manages two stretches of designated National Recreational River along the southern border of South Dakota, joined the MOA in 2005. The MOA ensures continued protection and active management of the bald eagle, least tern, piping plover, and pallid sturgeon. Bald eagle nesting and winter roosting sites are protected under the agreement. This state management plan for the bald eagle was written as a component of the MOA. The MOA can be viewed in Appendix A.



1.1.2 Tribal Issues

The Fort Laramie Treaty of 1868 called for permanent peace between the United States Government and the Sioux Nation. The US government ceded all land west of the Missouri River in South Dakota to the Sioux Tribe, in addition to providing schools, farming assistance, and other services to the tribe for a period of thirty years. The treaty could only be changed through a vote of three-quarters of the adult male tribal members (Treaty can be viewed at The Avalon Project Website, Accessed November 25, 2003). Hostilities continued however, and with the discovery of gold in the Black Hills, the Treaty was abrogated as settlers rushed in. The US government attempted to buy the land, but the Sioux refused and a war erupted. The conflict ended with the tribes forced onto present-day reservations. Although a Supreme Court ruling attempted to end the conflict over the Black Hills with a monetary settlement to the tribes (United States v. Sioux Nation of Indians, 448 U.S. 371 [180]), the tribes have never accepted the money and the issue continues to be contentious.

The tribes hold that the lands west of the Missouri River were taken illegally. Thus, they argue that the USACE lands should have been transferred to the tribes, not to the state (USACE 2001). Since the land transfer was an act of Congress, and this document does not address the legal issues of the land transfer per se, the issue of land ownership will not be discussed further.

1.2 General Species Account

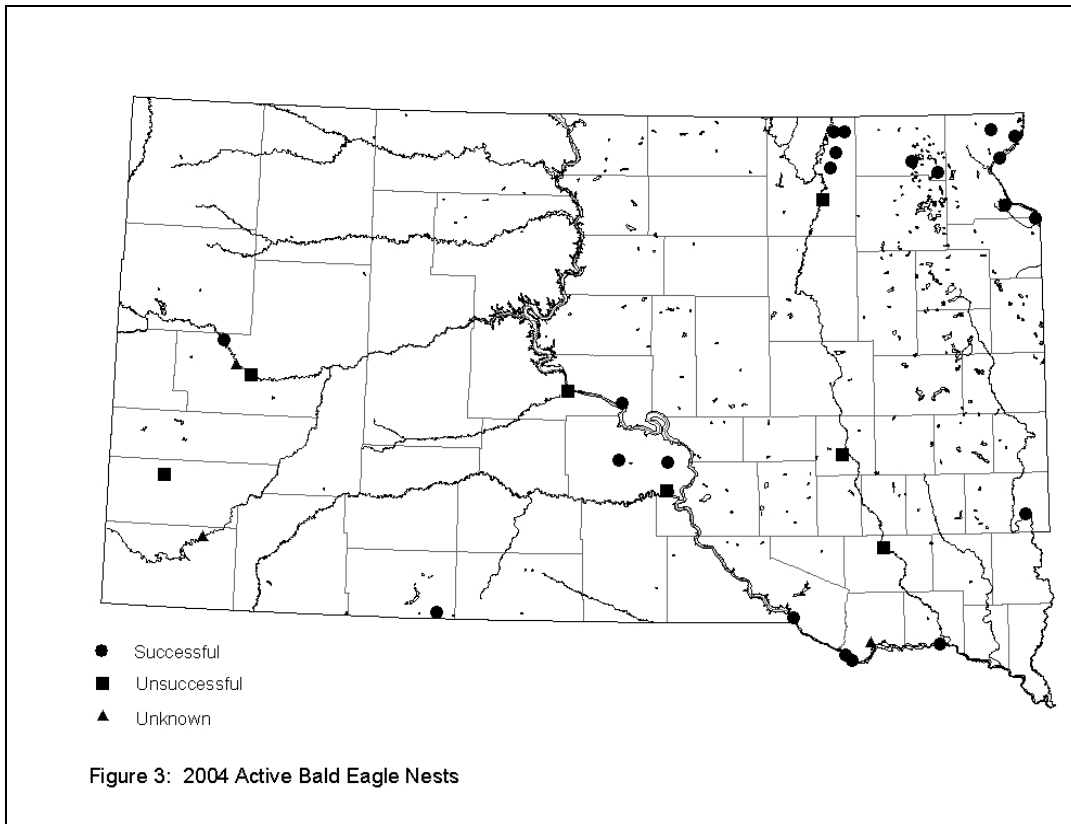
The bald eagle is a large, long-lived bird of prey in the Order Falconiformes and Family Accipitridae found exclusively in North America (Lincer et al. 1979). Adults have a brownish-black body with a white head and tail, while juveniles are uniformly brown in their first year, with an increasingly white head and tail until approximately 4 ½ to 5 ½ years of age, when they assume the adult plumage (McCullough 1989). The juvenile bald eagle is similar in appearance to the golden eagle (*Aquila chrysaetos*) (USFWS 1983). Bald eagles have a wingspan of up to 7.5 feet, with females slightly larger and heavier than males.

Bald eagles require large trees with horizontal branches for nesting or winter roosting. They tend to use the largest tree in the area (super canopy tree), with sturdy horizontal branches and a clear flight path to water (e.g. Anthony et al. 1982, Anthony and Issacs 1989, Grubb 1980). Bald eagles generally nest in cottonwoods (*Populus deltoides*) in South Dakota. In a 2004 bald eagle nest survey, all but one of 30 active bald eagle nests were in cottonwood trees, and one-third were along the Missouri River, primarily on the reach below Fort Randall Dam that is shared with Nebraska (Figure 3). Nests often occur in dead or dying cottonwoods that may fall at any time.

1.2.1 Reproduction

Bald eagles reach sexual maturity at four to six years of age, although they may be considerably older before they reproduce. They form long-term pair bonds, but if one member of the pair dies, the mate will accept a new partner. The pair makes a large nest of sticks lined with softer material such as weeds, grasses and sod. Generally the nest is constructed in the largest tree in the area with a clear flight path to water (Grubb 1980, Jenkins 1989). Most bald eagle nests are approximately 1.5 to 1.8 meters wide, and 0.7 to 1.2 meters deep. They are enlarged annually until they fall in a storm or under their own weight (Herrick 1933, Stalmaster 1987). The pair also often makes one or more additional nests in their territory (Grubb 1980). The purpose of these alternate nests is not well understood. They may provide insurance in case something happens to the primary nest (Stalmaster 1987).

A clutch consists of one to three eggs, with successful pairs raising one to two young, or very occasionally three (Gerrard and Bortolotti 1988). The eggs take 34 to 38 days to hatch. For the first few weeks, the young must be fed directly by their parents and parents assist in eaglet thermoregulation, shading them from the sun and brooding them in cold weather to keep warm (Jenkins 1989). The young fledge (leave the nest) 9 to 14 weeks after hatching. Parents may continue to care for the young for 4 to 6 weeks after fledging (USFWS Bald Eagle website, accessed December 3, 2004).



1.2.2 Wintering

In winter, bald eagles tend to congregate during the day near a readily available food source. They are often in areas near fish runs or congregations of waterfowl; in South Dakota, bald eagles often congregate just below the dams, where the water remains open all winter and food sources are plentiful. Bald eagles appear to follow each other from overnight roost sites to feeding areas, probably to locate food sources. Juveniles in particular may benefit from following adults to food (Knight and Knight 1983).

At night, especially in extreme weather, bald eagles roost communally in one or two large trees that provide some protection from the elements. These communal roosting sites have been shown to provide a warmer microclimate than the general ambient environment (Anthony et al. 1982, Hansen et al. 1981, Keister 1981, Keister et al. 1985, Stalmaster 1980, Stalmaster and Gessaman 1984). Winter roosts tend to be in secluded areas that provide protection from wind (Keister et al. 1985). Bald eagles are very sensitive to disturbance in winter communal roost areas (Martell 1992, Wood 1980).

1.2.3 Protection History

The bald eagle was first protected through the Bald and Golden Eagle Protection Act (BGEPA) in 1940 (16 U.S.C. §§ 668-668d, June 8, 1940, as amended 1959, 1962, 1972, and 1978), which recognized that the bald eagle was threatened with extinction. (Because of the similarity of golden eagles to juvenile bald eagles, golden eagles were

included in the Act.) Under the Endangered Species Preservation Act of 1966, a precursor of the Endangered Species Act (ESA), the Secretary of the Interior listed the bald eagle as threatened in Minnesota, Wisconsin, Michigan, Oregon, and Washington, and endangered in the remaining contiguous states in 1967. (They were never listed in Alaska) Bald eagles were placed on the ESA list in 1978. Since that time, the bald eagle population has increased dramatically, and the species was downlisted to threatened throughout its range in 1995. Bald eagle numbers have continued to increase, and the Service proposed delisting in July of 1999 (USFWS Website, Accessed February 16, 2005). The bald eagle was included on the first South Dakota state list of threatened and endangered species in 1978 as a state endangered species. Due to the increased number of nesting birds, the species was downlisted to state threatened by action of the SDGFP Commission in June 2003 (SDGFP Commission Minutes Unpublished).

The delisting process has progressed slowly for two main reasons. First, the ESA is presumed to take precedence over the BGEPA, so some activities that may disturb bald eagles would be banned under the BGEPA but are permitted under the ESA. However, once the species is delisted, the BGEPA regulations would take effect. Since the BGEPA is more restrictive than current ESA protections for a threatened species, the BGEPA is undergoing amendments to allow certain activities that might disturb bald eagles. Second, the ESA requires five years of monitoring following delisting. The USFWS would like to finalize monitoring plans prior to delisting so that the ongoing status of the bald eagle can be effectively determined. With adequate monitoring plans already in place, any decline in the population following delisting can be discovered promptly and corrective actions can be taken immediately. It is SDGFP's intent that this South Dakota plan will be incorporated as part of the nationwide monitoring.

1.2.4 Significance to the Tribes

For many Native American tribes, the bald eagle is a sacred symbol, often seen as a spiritual messenger. In the Lakota tradition, the bald eagle is considered a spirit which may be called on for aid, traditionally presiding over councils, hunters, war parties, and battles (Walker 1980). In addition, the bald eagle is central to many ceremonies, including marriages and burials, with bald eagle feathers and other parts playing an important role (Michigan State University College of Law Website, Accessed October 19, 2004). The tribes have a strong interest in the continued recovery of this important component of their cultural heritage.

The USFWS has established a national eagle repository that receives dead eagles and distributes them to Native Americans for religious purposes. Applications for eagles or eagle parts are processed on a first-come, first-serve basis, with a typical wait of three to five years (USFWS National Repository Website, Accessed November 12, 2004).

The cottonwood, which the bald eagle uses almost exclusively in South Dakota for nesting and winter roosting, is also considered sacred by many Native American tribes. It was used as a part of religious ceremonies (Deloria 1929), and was an important historical source for heat and shelter. Additionally, Native Americans recognize its importance to a large number of wildlife species, including the bald eagle (American Indian Culture Research Center Website, Accessed October 21, 2004). Therefore retaining the cottonwood forest is important for both cultural and natural resources in South Dakota.

1.2.5 Status of the Species Rangelwide

The bald eagle has made a remarkable recovery throughout its range. In 1981, there were only 568 known breeding territories in the continental United States (the bald eagle is not found in Hawaii, and was never listed in Alaska, where an estimated 40,000 bald eagles reside). Ninety percent of these were concentrated in ten states; Florida, Minnesota, Wisconsin, Washington, Michigan, Oregon, Maine, California, Maryland, and Virginia (USFWS 1983). By 1999, there were approximately 6,470 breeding pairs reported in the continental states (64 FR 36453 (July 6, 1999)). The population has continued to grow, and an annual national winter bald eagle survey continues to show increasing numbers throughout most of the country (Midwinter Bald Eagle Survey Website, Accessed February 1, 2005).

1.2.6 Status of the Species in South Dakota

The 1983 Northern States Bald Eagle Recovery Plan (USFWS 1983) reported the bald eagle as a rare breeder in South Dakota, and noted few historical reports of wintering bald eagles in South Dakota, primarily in the tailrace areas below the dams. Accordingly, the Recovery Plan required no bald eagle breeding or wintering areas in the state. Wallace Jobman, a USFWS biologist located in Pierre from 1978 through 1985, reported a consistent annual wintering concentration of bald eagles below Oahe and Fort Randall Dams during that time (Pers. Comm. Wallace Jobman, USFWS).

South Dakota's rivers and wide riparian forests provide prime habitat for the bald eagle, and today the state boasts a thriving population of both nesting and wintering bald eagles. The first documented attempt of bald eagles to nest in South Dakota in more than a century was at Sand Lake National Wildlife Refuge in 1992 and 1993. These attempts were not successful, but in 1993, a pair of bald eagles fledged two young from a nest on the Karl Mundt National Wildlife Refuge (Pers. Comm. Edward Rodriguez, USFWS). A 2004 statewide survey of bald eagle nests documented 30 bald eagle nests that were active at some point in the season, 20 of which produced fledglings (Table 1). Observers confirmed 34 fledged bald eagles in 2004, for an average of 1.34 fledged eagles per active nest.

As discussed in Section 2.2.1, bald eagle pairs often make and maintain several nests and may nest in any of them in a given year. For this reason, SDGFP also surveyed and monitored nests just outside of the South Dakota Border (Table 1). In 2004 there were ten nests on the Nebraska side of the boundary stretch of the Missouri River, three of which were confirmed to be successful. In addition, a single nest was monitored just over the South Dakota border along Lake Traverse in Minnesota. This nest was successful. Including the nests just outside of the South Dakota border, 40 fledglings were confirmed to be successful, for an average of 1 fledgling per active nest.

Table 1 2004 Bald Eagle Nest Success in South Dakota

	Just SD	Nests just over the SD Border	Total Nests (SD and bordering)
Active Nests at some Point in the Season	30	10	40
Successful Nests (Produced at least 1 fledgling)	20	4	24
Unsuccessful Nests (Active but no young produced)	7	1	8
Unknown (Could not re-locate the nest)	3	5	8

In cooperation with the national Midwinter Bald Eagle Survey (Midwinter Bald Eagle Survey Website Accessed February 1, 2005, SDGFP Website, Accessed February 1, 2005), SDGFP surveys the Missouri River from the southeastern tip of the state north until the end of open water in Lake Oahe (generally Whitlocks Bay) annually. The number of wintering bald eagles varies annually (Table 2), probably primarily due to weather conditions. Bald eagles are known to have communal roost sites where they spend the night during inclement weather at the Oahe Downstream Recreation Area below Oahe Dam, in both the Randall Creek Recreation Area and in the Karl Mundt Refuge below Fort Randall Dam, and in the Chief White Crane Recreation Area below Gavins Point Dam. There are also reports of large congregations of wintering bald eagles at the White River confluence. Winter roost areas below the dams are closed to vehicular traffic during winter months to avoid disturbing bald eagles (SDGFP Website, Accessed December 14, 2003).

2 THREATS TO BALD EAGLES

At the time of listing, one of the major threats to the species was environmental contamination. Other major threats included habitat loss, shooting, and trapping (USFWS 1983). While the species has shown a remarkable recovery, and is expanding both in numbers and range (Midwinter Bald Eagle Survey Website, Accessed February 1, 2005), many of these threats remain.

Table 2 Results of the Bald Eagle Midwinter Survey in South Dakota

Year	Bald Eagles				Golden and Unknown Eagles
	Adult	Imm.	Unk.	Total	Total
1986	55	11	0	66	25
1987	147	6	2	155	11
1988	77	35	0	112	9
1989	163	48	3	214	25
1990	173	17	3	193	6
1991	42	27	0	69	0
1992	86	26	0	112	8
1993	54	4	0	58	19
1994	226	70	0	296	6
1995	208	14	0	222	20
1996*	173	34	0	207	22
1997	136	28	0	164	17
1998*	236	91	0	327	16
1999	191	100	2	293	13
2000	113	81	0	194	8
2001	59	70	1	130	12
2002	173	61	0	234	19
2003**	158	55	5	218	35
2004	104	28	8	140	17

* includes additional observations

** portion of one route between Running Water and Gavins Point Dam was not covered.

Source: South Dakota Bald Eagle Awareness Days Website, Accessed October 15, 2004.

2.1 Environmental Contamination

From the mid 1940's until it was banned in 1973, the organochlorine pesticide Dichloro-diphenyl-trichloroethane (DDT) was widely in use and prevalent in the environment (EPA Website, Accessed Nov. 6, 2003). DDT and its metabolite DDE repressed reproductive success by causing eggshell thinning, often causing eggs to break before young could hatch (Clark et al. 1998). Although DDT was banned thirty years ago, detectable levels remain in the environment, and may still be implicated in nest failures (Clark et al. 1998, Elliot and Norstrom 1998, Welch 1994, Wiemeyer et al. 1993). The effects of DDT have decreased greatly and can be expected to continue to decline.

Poisoning is still responsible for a number of bald eagle deaths annually. Bald eagles have been known to feed on carcasses laced with poison intended to control other predators. They can also die from secondarily ingesting poison by feeding on a dead animal that has eaten a poisoned carcass (Allen et al. 1996, Franson et al. 1995). Lead shot has also been implicated in bald eagle deaths from ingestion of wounded waterfowl (Lingle and Krapu 1988). It is no longer legal to use lead shot for waterfowl in South

Dakota, although it is permitted for turkey and big game (SDGFP Website, Accessed December 3, 2004).

2.2 *Habitat Loss*

Habitat loss is widely considered to be the greatest threat facing the species today (Shapiro et al. 1982). Bald eagles require mature trees near water for both nesting and winter roosting. Natural senescence and tree removal for conversion to cropland and other uses have long-term impacts on bald eagle habitat. Trees planted now for bald eagle habitat will not be large enough for bald eagle use for 30 to 50 years.

Furthermore, the bald eagle's preferred nesting and wintering habitat often coincides with favored areas for human development and activities. River and lakeside areas are often cleared first for farming or housing, concentrating hunting and other recreational activities in the remaining undeveloped habitat. South Dakota saw more than a ten-percent rise in housing units between 1990 and 2000 (US Housing Market Conditions Website, Accessed November 23, 2003). Increased development will continue to impact bald eagle use areas.

Bald eagles generally prefer to both nest and forage near water. The Northern States Bald Eagle Recovery Plan (USFWS 1983) suggests that a buffer zone of approximately 30 acres be maintained around active bald eagle nests during the nesting season (January through August in South Dakota). This area should have minimal human intrusion during the nesting season. Nesbitt et al. (1993) suggest that an 820-foot (15-acre) buffer zone around nests is sufficient to avoid disturbing nesting bald eagles.

While bald eagles are undeniably sensitive to human disturbance, especially in the pre-laying through incubation stages (Grubb 1980, Grubb et al. 1992, Hansen et al. 1981, Stalmaster and Newman 1978), in some cases they have proven remarkably tolerant of a wide range of human activities (Stalmaster and Kaiser 1997, Knight and Knight 1984, Mathisen 1968). In fact, there are a growing number of "suburban" nests, with pairs nesting near developed areas. In a study comparing nest and fledgling success between so-called suburban birds with those in more remote areas, Millsap et al. (2001) found that chicks in suburban and rural nests had similar survival until fledging. However, the birds that had been raised in suburban nests were more likely to die of anthropogenic causes (primarily electrocution and vehicle collisions) during their first year than their rural counterparts.

2.3 *Cottonwood Degeneration*

The cottonwood tree, with its large size and sturdy, horizontal branches, is an ideal species for both nesting and roosting activities. However, massive stands of cottonwood trees were killed by the permanent impoundments formed by the large dams built on the Missouri River. Cottonwood regeneration has all but ceased on remnant river reaches in gaps between the reservoirs because flow reductions no longer enable the channel to

meander across its floodplain. Regulation of the Missouri River has had serious implications for a number of species and their ecosystems, including cottonwoods (National Research Council 2002).

To become established, cottonwoods require specific environmental conditions. The seeds are only viable for a few weeks and the seedlings are intolerant of shade and soil litter. Thus, the timing of seed dispersal and flow recession after floods is critical. Cottonwoods produce seeds during a two to six week period in the spring, coinciding with the time the river naturally flooded prior to dam construction (Scott et al. 1993). Before the dams were built, peak flows occurred from April to June, rather than February to March when the peak flow typically occurs under current management (Reily and Johnson 1982). Before dams regulated the river's flow, new point bars formed as the river shifted and deposited sediment during floods. Over time, low benches near mean river level initially colonized by cottonwood forest became elevated by sedimentation during flooding. In some places, the surfaces of old cottonwood forests are now twenty feet above mean river level. While mature trees may be considerably above the water table, their roots probably remain at the original germination level near or in the capillary fringe (Reily and Johnson 1982). Because best growth is attained when the roots are near the water table, the cottonwood is a difficult species to cultivate, with extensive watering required for at least the first year (Friedman and Lewis 1995). Cottonwood grows quickly however. Under the right conditions, the taproot can grow up to one yard (one meter) in a single growing season (Scott et al. 1993).

With the completion of the Oahe Dam in 1958 and Big Bend in 1962, most of the last stretches of the Missouri floodplain in South Dakota that had experienced overland flooding were either permanently inundated or fully protected from flooding (Leatherberry et al. 2000, National Research Council 2002). A 1988 study of the forested area from the Oahe Dam face downstream to the end of the USACE property (including approximately 686 acres of forested land) found only one plot of 106 sampled with any cottonwood seedlings and saplings (McCormick and Sowers 1988).

The effects of changes in flow regime have been compounded by extensive riverbank stabilization, which further reduces the channel meandering process and makes the river more entrenched (National Research Council 2002). The remnant (non-reservoir) portions of the Missouri in South Dakota, including the Missouri National Recreational River, are becoming increasingly incised. The USACE reports that 22% of the stretch from Fort Randall to Lewis and Clark Lake and 32% of the stretch from Gavins Point to Ponca is currently stabilized in a mix of private and USACE stabilization projects (USACE 2003). The riparian forest composition is changing from a cottonwood/willow dominated forest to a forest dominated by green ash (*Fraxinus pennsylvanica*), eastern red cedar (*Juniperus virginiana*), boxelder (*Acer negundo*), and Russian olive (*Elaeagnus angustifolia*), an exotic. The transition from a cottonwood-dominated forest

is accelerated by beavers, which may preferentially fell cottonwood (Lesica and Miles 2001).

Cottonwoods begin to degenerate rapidly after 70 years (Harlow and Harrar 1969), and their maximum lifespan is not usually more than 125 years (Hightshoe 1988). Since cottonwoods along the Missouri River today are at least 50 years old or older, regeneration efforts should begin immediately to replace the current aging population. Even with immediate planting, there will be a gap in the age structure when most of the current mature trees have died, but the younger trees have not reached adequate size for bald eagle use. A comparison of the number of cottonwoods on LaFramboise Island in 1966 and 2003 demonstrates this natural thinning of the cottonwood forest (Table 3). The number of cottonwoods on the island almost halved between 1966 and 2003, while the mean and median size of the cottonwoods increased, indicating that few young trees are establishing.

Table 3 Characteristics of cottonwoods sampled on LaFramboise Island in 1966 and 2003 (from Ode 2004)

	Median DBH (Diameter at breast Height)	Ave. DBH	# Trees /Acre	Basal Area per Acre*
Rogers 1966	10.5"	11.2"	138	10.7 sq.ft./A
Ode 2003	16.9"	17.4"	75	9.1 sq.ft./A

*Basal area per acre is defined as the cross-sectional area of tree stems (measured at breast height) on an acre.

It is important to note that while bald eagles preferentially use cottonwood in South Dakota, the structure and location of the tree is apparently more important in selection than species (Anthony et al. 1982, Grubb 1980, McEwan and Hirth 1979). If other species of trees have the appropriate characteristics and location, bald eagles will likely use them.

2.4 Electrocutation

Both electrocution and collisions with power lines kill numerous bald eagles annually. A small proportion of lines are examined for mortalities, and many corpses are likely not recovered due to thick vegetation or immediate removal by scavengers. A survey of bald and golden eagle deaths since the 1960's found that 12 percent of 4,300 eagles necropsied had died from electrocution (Franson et al. 1995).

Power lines are an attractive perch for both bald and golden eagles, especially in areas where the lines provide a good view of the surrounding area and the crossarms are perpendicular to prevailing winds (Steenhof 1978). Electrocution occurs when the fleshy parts of a dry bird or the feathers of a wet bird (wet feathers conduct electricity at 5,000 to 7,000 volts, dry feathers at about 70,000 volts) make phase-to-phase or phase-to-ground contact. Bald eagles have a wingspan of up to 7.5 feet, so the phases must

either be located farther apart than that or on different planes on the pole (Avian Power Line Interaction Committee 1996 - hereafter APLIC).

A few poles are responsible for a vast majority of electrocutions, so identifying and retrofitting problem poles would prevent most power line mortalities. To address bird-powerline issues, a consortium of power and natural resource groups have developed APLIC to find solutions for the electrocution issue. APLIC developed a handbook, "Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996," (APLIC 1996) which provides suggested changes to powerlines including phase spacing and use of insulators to reduce the risk of bird electrocutions.

Because they primarily fly during the day and have good vision, raptors are thought to rarely collide with power lines compared with other bird species which migrate at night. However, Steenhof (1978) suggests that in poor weather with reduced visibility, bald eagles may collide with power lines. APLIC (1994) notes that counts of bird-power line collisions are likely underrepresented due to inherent biases in the search methods. Additionally, if high collision areas occur in remote areas, mortalities are likely to go unreported.

2.5 Shooting and Trapping

In the past, shooting and trapping were identified as a primary cause of direct bald eagle mortality (Braun et al. 1975, Franson et al. 1995, Stalmaster 1987, USFWS 1983). Killing bald eagles is illegal under the ESA, the BGEPA, the Migratory Bird Treaty Act, and the Lacey Act. Some shooting still occurs (Olson 1999), although the number of shooting mortalities is difficult to judge. Leg-hold traps kill or maim bald eagles, which often lose digits or entire legs (Martell 1992). South Dakota hunting regulations require that traps be set farther than 30 ft (9 m) from exposed bait that would be visible to airborne raptors (SDGFP 2004).

3 STATE GOALS

3.1 Nest Goals

As noted, prior to 1992, there were no records of nesting bald eagles in South Dakota for more than a century. In 2004, 30 nests were documented to be occupied by bald eagle pairs at some point during the nesting season, with 20 of those producing fledglings. Future surveys will provide more complete information about bald eagle nesting trends in South Dakota, but the state goal is set at a 5-year running average of 25 active (occupied at some point during the season) nests per year.

3.2 Winter Roost Goals

As indicated in Table 2, the number of wintering bald eagles surveyed in South Dakota fluctuates annually. The mid-winter bald eagle survey is performed in a single day, so it

does not account for the birds' substantial within-season variability in location. Bald eagle use of winter roosts likely depends on weather conditions and food availability. During inclement weather when the river is mostly ice-covered, eagles congregate overnight in certain roost areas (current roosts are located below Oahe, Fort Randall, and Gavins Point Dams). Since there are few places in South Dakota where cottonwoods are still regenerating naturally, the existing cottonwood trees will continue to degenerate and the forest composition and structure will change considerably unless replanting efforts are successful.

To ensure that appropriate habitat for winter roosting persists below the dams, SDGFP is committed to no net loss of appropriate winter roosting acreage in the SDGFP-managed areas below Oahe, Fort Randall, and Gavins Point Dams. Currently on SDGFP land, there are approximately 295 acres of primarily cottonwood forest below Oahe Dam, 280 acres of primarily cottonwood forest below Fort Randall Dam, and 240 acres of primarily cottonwood forest below Gavins Point Dam. These acreages will be re-estimated at ten-year intervals.

The USFWS, which manages the Karl Mundt refuge below Fort Randall Dam, has also committed to a no-net loss of cottonwood forest in that area.

3.3 MONITORING

3.3.1 Nest Monitoring

SDGFP will monitor bald eagle nests for occupancy and success in producing fledglings statewide annually, with flights to locate nests every three to four years, as needed. Nest monitoring will continue for ten years post-delisting.

3.3.2 Winter Eagle Monitoring

3.3.2.1 Midwinter Bald Eagle Survey

SDGFP will continue to participate in the Midwinter Bald Eagle Survey. These counts are currently done in conjunction with waterfowl surveys, and will continue with them for the foreseeable future.

3.3.2.2 Winter Roost Site Surveys

SDGFP managers will conduct a minimum of three surveys of the winter roost sites below Oahe Dam and Gavins Point Dam per year. These surveys will take place during especially cold or inclement weather when the largest number of bald eagles are likely to occupy the roosts. To avoid disturbing the eagles, surveys are done from a vehicle outside of the roost area. Counts are should be performed at from one-half hour before sunrise to one-half hour after sunrise or from one-half hour before sunset to one-half

hour after sunset. The evening survey time is preferred because the birds are easier to count when they are flying into the roost.

The USFWS (Lake Andes National Wildlife Refuge Complex) has monitored the bald eagle roost below Fort Randall Dam in the past and will continue to do so (Pers. Comm. Michael Bryant, USFWS).

3.3.2.3 Additional Winter Roosts

If further winter roost sites are identified on SDGFP lands, SDGFP will monitor and protect them with the same protections as the currently known winter roost sites.

3.4 Buffers and Use Restrictions

3.4.1 Nest Buffers

To ensure that nesting eagles on state lands are not disturbed, SDGFP will maintain a 1/2-mile buffer zone around active bald eagle nests during the nesting season. In addition, managers will fence off or post “no entry” signs a minimum 820-foot buffer zone around active bald eagle nests during the nesting season (February - August) to keep the public from disturbing the nests on SDGFP land if human disturbance is likely to be an issue. Fencing will be accompanied by educational signs to ensure that the public understands the importance of undisturbed areas for bald eagles.

While SDGFP encourages landowners to leave as much of an undisturbed buffer around active bald eagle nests as possible, SDGFP appreciates that they may need to engage in activities near active nests. SDGFP suggests that landowners be aware of eagle behavior and try to avoid disturbing the nest site as much as possible. Eagles calling or flushing from the nest upon approach are disturbed and may abandon the nesting effort. If brush and other materials block the line of sight to the nest, eagles tend to be less sensitive to disturbance (Stalmaster 1980).

3.4.2 Winter Roost Site Buffers

SDGFP will not perform any construction within 1/4 mile of a bald eagle winter roost during the time that it is occupied (October/November through March/April). Known SDGFP managed winter roost areas are closed to vehicular traffic during the winter months:

Oahe Downstream Recreation Area - Closed November 1-March 31

Randall Creek Recreation Area-Closed October 1-April 30

Chief White Crane Recreation Area-Closed November 1 through March 31

Foot travel is permitted in those areas, but visitors must not disturb roosting eagles and are encouraged to enter the area in midmorning after most eagles have finished foraging and to leave the area before dusk when eagles tend to return to the overnight roosting

areas. Visitors are encouraged to stay at least 1/4 mile from bald eagles and try to keep as much cover between them and the birds to avoid disturbing the bald eagles as much as possible (SDGFP Website, Accessed October 18, 2004). If eagles call or begin to fly, visitors are too close and should leave the area immediately.

If congregations of bald eagles begin to use other SDGFP managed areas as winter roosts, SDGFP will enact similar restrictions to protect them from disturbance and encourage continued bald eagle use.

3.5 Cottonwood Protection/regeneration

3.5.1 SDGFP Commitments to Long-term Management

The MOA (described in Section 3.1.1) was developed to ensure continued protection of federally listed species on transferred lands (Appendix A). Since the trees planted now will only be suitable for bald eagle use in 50 to 70 years, SDGFP acknowledges the long-term commitment inherent in our current efforts. For bald eagles to continue to thrive in a changing environment, future generations of managers will need to continue to enhance and protect appropriate habitat.

In addition to providing habitat for bald eagles, the cottonwood forest provides habitat for a diverse array of plants and animals (Ode 2004, Rumble and Gobeille 2004, Backlund et al. Website Accessed December 21, 2004). In a recent study of bird diversity in the area from Pierre to Mobridge, Rumble and Gobeille (2004) found that cottonwood forests have a higher total bird abundance and species diversity compared with other woodland types. The diversity in both species composition and available habitat (snags, hollow logs and branches, etc.) in midsuccessional cottonwood forest is greater than either older or younger stands (Johnson 1992). Without artificial regeneration or restoration of river flows, the existing forests in many areas are likely to be replaced by monotypic stands of juniper (*Juniperus virginiana*) and Russian olive (*Elaeagnus angustifolia*) (Ode 2004).

Outdoor recreation is an important part of life in South Dakota. In 2003, there were 7,572,548 visits to South Dakota state parks, recreation areas, lakeside use areas and nature areas. Nationally, bird watching has increased significantly in the past decade. A survey on outdoor recreation activities in South Dakota (Cordell et al. 2003) reports that 32.2-percent of recreators birdwatch annually. Thus, managing for bald eagle habitat will also enhance bird diversity and productivity, resulting in an added benefit of filling a recreational niche.

3.5.2 Natural Regeneration of Cottonwood-River Hydrology

As discussed above (Section 3.3), due to lack of spring overbank flooding and associated channel meandering, there has been little natural cottonwood regeneration

along the Missouri River since dam construction. A spring pulse that stimulates natural cottonwood regeneration would not only help to establish cottonwoods, but would also serve to create and maintain habitat for least terns and piping plovers and possibly provide a spawning cue for the pallid sturgeon as well as for other native fishes. SDGFP strongly encourages the USACE to follow a more natural flow regime including a high spring rise and low summer flows.

During the high water years of 1996 and 1997, the outside bends along the river sections below Fort Randall and Gavins Point Dams eroded and sandbars formed on the inner bends. Cottonwood seedlings are now established on these accreting banks. While the flow levels that occurred during the 1996-1997 floods are unlikely to be repeated in the near future, smaller spring flows sufficient to move banks would likely cause natural cottonwood regeneration. SDGFP recognizes that regeneration through flows would be cheaper and more effective than relying on mechanical methods. The planting efforts described below are necessary because of the lack of regeneration via alteration to the flow regime.

3.5.3 Existing Planting Efforts

SDGFP Park managers have planted cottonwoods in parks near Oahe, Fort Randall, and Gavins Point dams. Unfortunately, several of these plantings have had low survival rates to date, primarily due to drought, deer, and grasshoppers.

Managers along the Missouri River are planting four cottonwoods to replace each cottonwood tree removed for human safety reasons. Managers in winter roost areas have planted areas as described below.

3.5.3.1 Oahe Downstream

SDGFP planted about 500 cottonwood seedlings as bare root stock in approximately 1 1/4 to 1 1/2 acres of cottonwoods below Oahe Dam in recent years (Pers. Comm. Pat Buscher, SDGFP). These trees have had about 80 percent mortality, probably primarily due to drought conditions. In 2004, 200 sapling trees, including 80 cottonwoods, were planted on LaFramboise Island, about five miles downstream from Oahe Dam, to replace trees that were removed to put in a water well. As of this writing, survival of those trees had not been evaluated (Pers. Comm. Pat Thompson, SDGFP).

3.5.3.2 Fort Randall Downstream

Cottonwood seedlings (as bare root stock) have been planted along a strip of the shoreline below Fort Randall Dam. These seedlings have had about 90 percent mortality, probably due to drought conditions and grasshoppers.

3.5.3.3 *Gavins Point Downstream*

Managers planted 375 cottonwood seedlings as bare root stock in 2003-2004. The saplings were planted in gaps in an existing mature cottonwood forest over an approximately five-acre area. They have had approximately 60 percent survival thus far. In addition, fifteen cottonwood seedlings were planted in the Lewis and Clark Recreation Area just above Gavins Point Dam. About 50 percent of these trees have survived, with mortalities caused by deer.

3.5.4 **Planned Planting Efforts**

Since several studies (e.g. BIA 1952, Johnson 1994, Rumble and Gobeille 2004) have identified cottonwood forests as biologically and culturally important, SDGFP believes that it is critical to keep as much of the land along the river in native cottonwood forest as possible. SDGFP entreats other agencies, in particular the USACE as directed in the 2000 and 2003 Biological Opinions (BO) (USFWS 2000, USFWS 2003), to assist in developing methods to effectively regenerate cottonwood forests and in funding these projects. SDGFP has identified several tasks related to cottonwood regeneration that the agency believes are necessary to begin the planting/regeneration process.

Task 1: Determine how much longer cottonwood forests at existing winter roost sites (Oahe Dam downstream, Fort Randall Dam Downstream, and Gavins Point Downstream) will remain functional for bald eagles.

Task 2: Identify actions to prolong the life and utility of existing cottonwood forests.

Task 3: Develop a replanting/regeneration plan based on the expected degeneration rate of the existing forest.

Task 4: Determine the most effective and economical methods for establishing cottonwoods

3.5.4.1 *Transferred Lands*

Thousands of acres of cottonwood habitat were inundated after dam construction (BIA 1952, Leatherberry et al. 2000), and much of the land that forms the current banks along the reservoirs in South Dakota is not suitable for trees (Pers. Comm. Dan McCormick, SDGFP). SDGFP will evaluate the potential of transferred lands for cottonwood regeneration in conjunction with development of land management plans as the areas to be transferred are identified. Cottonwood trees will be planted where appropriate.

To locate further SDGFP areas that may be suitable for cottonwood planting, SDGFP is providing support for a graduate student project designed to examine potential locations for cottonwood planting and regeneration. This study will help to identify appropriate

sites for cottonwood plantings as well as to identify methods most likely to promote tree survival.

3.6 *Private Lands Outreach*

3.6.1 Landowners Options for Land Protection

Many bald eagle nests are on private land, and bald eagles as well as other wildlife species benefit from landowners who are good stewards. There are a number of options available for landowners who are interested in protecting and enhancing their land for wildlife, including bald eagles. Landowners can determine the type of commitment they would like to make and choose a protection strategy that best fits their goals. The most common method of long term protection is a conservation easement, but there are several other commonly used methods including: bequest for conservation, donation with reserved life estate, and bargain sale (Northern Prairies undated). In addition, landowners wishing to protect riparian areas with trees used by bald eagles can get federal assistance to put up fencing and watering facilities to prevent livestock damage to trees (USFWS Partners Program website Accessed March 4, 2004).

Conservation easements are a tool whereby landowners can protect natural land permanently while continuing to own it. The landowner places certain restrictions on the land but retains the ability to sell the land or pass it on to heirs. Because the conservation easement may reduce the value of the land, there may be tax advantages.

A bequest for conservation is a way to ensure that the land will pass on to a conservation organization of your choice. This option does not provide financial advantages during the landowner's lifetime, but may reduce estate taxes, and provides some assurances regarding management after the landowner's death.

In a donation with reserved life estate, the landowner donates the land to a conservation organization or agency immediately while retaining the use of the property during the landowner's lifetime. Under this arrangement, the landowner may be eligible for some tax advantages.

For land that has appreciated considerably, the owner may want to sell the land to a conservation organization as a bargain sale. In this way, the landowner receives some money from the sale as well as receiving an income tax deduction since the land was sold under market value with the knowledge that the land will not be developed.

3.6.2 Planting Easements

Funding may be available through Natural Resources Conservation Service (NRCS) for cottonwood plantings on the Missouri River floodplain. Landowners interested in

developing conservation plans for bald eagles by planting or protecting cottonwood trees should contact their local NRCS office for information.

4 PUBLIC OUTREACH/EDUCATION

The increasing number of bald eagles in South Dakota provides viewing opportunities for many people throughout the state. SDGFP would like to promote bald eagle viewing, and help the public to view responsibly. In order to encourage public interest and education about bald eagles and their habitat, SDGFP hosts an annual program; "Bald Eagle Awareness Days." This program includes several bald eagle related activities, including activities for children, raptor presentations with live birds, and a poster contest. Information about these and other events can be found on the web at <http://www.sdgifp.info/Wildlife/Diversity/bead/index.htm> (Bald Eagle Awareness Days Website, Accessed January 20, 2005).

In addition to informing the general public about bald eagle needs, it is important for resource agencies and others involved in land-use projects to understand how to plan and complete projects without disturbing bald eagles. SDGFP will develop a brochure aimed at these development groups with best management practices to avoid disturbing nesting or roosting bald eagles.

5 NEED FOR FURTHER INFORMATION/STUDIES REQUIRED

5.1 Cottonwood Regeneration

Methods to successfully regenerate cottonwoods artificially (without a natural overland flow event) are well documented, but to be successful plantings must be located appropriately in locations where they will flourish. Furthermore, planting individual trees is expensive, limiting planted area. SDGFP plans to work with South Dakota State University (SDSU) to locate areas where cottonwood regeneration is likely to be successful and to experiment with different methods of regeneration.

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Appendix A

MEMORANDUM OF AGREEMENT

AMONG

SOUTH DAKOTA DEPARTMENT OF GAME, FISH AND PARKS, U.S. FISH AND WILDLIFE SERVICE, U.S. ARMY CORPS OF ENGINEERS, AND NATIONAL PARK SERVICE

Least tern, piping plover, pallid sturgeon, and bald eagle management, protection, and recovery along the Missouri River in South Dakota

I. Purpose

The purpose of this Memorandum of Agreement (MOA) is to provide guidance and specific agency commitments for management, protection, and recovery of the least tern, piping plover, pallid sturgeon, and bald eagle along the Missouri River for the four signatory agencies, since each has a statutory responsibility for endangered species recovery. The signatory agencies agree that fulfillment of conditions contained in this MOA will help enhance annual productivity and in the long term contribute to recovery of these species.

II. Actions

It is the intent of the signatory agencies to cooperatively protect and manage nesting populations of the least tern and piping plover along the Missouri River in South Dakota through monitoring, site protection, law enforcement, and public outreach. It is also the intent of the signatory agencies to protect bald eagle nesting sites and important winter roost sites along the Missouri River in South Dakota. Additionally, signatory authorities will commit to protect pallid sturgeon and their habitat by minimizing threats from existing and proposed human activities, law enforcement and public outreach.

A. South Dakota Department Of Game, Fish And Parks (SDGFP):

1. Will hire at least three seasonal employees each nesting season to be stationed where most needed to assist the U.S. Army Corps of Engineers (Corps) in monitoring and protecting least tern and piping plover nesting areas.
2. Will provide law enforcement assistance where and when most needed to patrol for human disturbance at least tern and piping plover nesting colonies up to 10 potential weekend periods from Memorial Day weekend to August 15 (including the high use events such as the July 4 holiday). This would be a cooperative effort by both SDGFP and the U.S. Fish and Wildlife Service (Service) providing staff on the river for the tern and plover nesting period. The details of such efforts will be worked out on an annual basis and dependent on nesting locations and active recreation areas on the river.

3. Will make arrangements with the Service and the Corps to obtain the necessary tern and plover training for law enforcement and seasonal personnel.
4. Will work cooperatively with the Corps and the Service to develop a Missouri River Management Plan for least terns, piping plovers, pallid sturgeons, and the bald eagles that establishes biological/conservation goals for South Dakota and management actions to achieve those goals. Management actions would include at least the following actions.
 - A.) On sites owned or managed by SDGFP, will close portions of the area where least terns or piping plovers are nesting, to include appropriate buffer zones.
 - B.) On sites owned or managed by SDGFP, will buoy off least tern foraging areas if potentially impacted by watercraft traffic.
 - C.) Will participate in public outreach efforts, including but not limited to placing informational posters at recreation sites, distributing informational brochures to recreation site users, random patrolling of nesting areas, and posting of nesting areas. Results of random patrolling of nesting areas will help set priorities for law enforcement follow-up.
 - D.) Will participate with signatory agencies and other interested entities in seeking solutions to site-specific threats to nesting success, such as livestock grazing.
 - E.) On sites owned or managed by SDGFP, will develop specific management strategies on sites consistently used each year by least terns and piping plovers, such as fencing or posting sites prior to arrival of nesting birds.
 - F.) Will not remove bald eagle nest trees on areas owned or managed by SDGFP, except for limited removal of single trees within campgrounds that pose a human safety hazard. Any tree removed will be replaced at a 4:1 ratio.
 - G.) Except for limited removal of single trees within campgrounds that pose a human safety hazard, will not remove trees from documented bald eagle winter roost sites if removal could adversely affect winter roost site use at areas owned or managed by SDGFP. Any tree removed will be replaced at a 4:1 ratio.
 - H.) Will continue winter recreational limits currently placed by the Corps of Engineers to protect known bald eagle roost sites, such as at Chief White Crane below Gavins Point Dam and Campground No. 3 below the Oahe Dam, and will evaluate future restrictions on a case-by-case basis.
 - I.) Will not construct within $\frac{1}{4}$ mile of bald eagle roost areas during the time of roost occupation.

- J.) Will not construct within ½ mile of bald eagle nests during the nesting season.
- K.) Will continue law enforcement and public outreach activities at State park and recreation areas in regard to State regulations prohibiting the take of pallid sturgeon.

B. U.S. Fish and Wildlife Service (Service):

1. Will investigate all Complaints of Violation concerning take and nest disturbances at tern/plover sites and/or colonies.
2. Will provide law enforcement assistance commensurate with State law enforcement action where and when most needed to patrol for human disturbance at nesting least tern and piping plover colonies up to 10 potential weekend periods from Memorial Day weekend to August 15 (including the high use events such as the July 4 holiday). This would be a cooperative effort by both SDGFP and the Service providing staff on the river for the tern and plover nesting period. The details of such efforts will be worked out on an annual basis and dependent on nesting locations and active recreation areas on the river.
3. Will provide law enforcement guidance and training to Corps and SDGFP personnel for proper documentation on investigation of potential violations.
4. Will work with SDGFP and the Corps to provide technical assistance and review the development of a Missouri River Management Plan that establishes biological/conservation goals for South Dakota and management actions to achieve those goals.
5. Will work cooperatively with the Corps and SDGFP to detail an experienced Service person to craft a legal process such as a Habitat Conservation Plan, or some similar process, that will allow the State to have assurances for active management and potential “take” opportunities.

C. U.S. Army Corps of Engineers (Corps):

1. Will provide yearly survey and productivity monitoring techniques training for all seasonal and permanent employees working with least terns and piping plovers.
2. With assistance from SDGFP seasonal employees, will conduct distribution and census surveys, and productivity monitoring on all potential nesting habitat.
3. Will ensure near real time data availability to all signatories, including all nest locations and nest and chick status, through its web based Data Management System.
4. With assistance from SDGFP seasonal employees, will implement nest specific management actions at all nesting sites (cages, moving nests, etc.).
5. On sites owned or managed by Corps, will close portions of the area where least terns or piping plovers are nesting, to include appropriate buffer zones.
6. On sites owned or managed by Corps, will buoy off least tern foraging areas if potentially impacted by watercraft traffic.

7. Will work cooperatively with SDGFP and the Service to develop a Missouri River Management Plan for least terns, piping plovers, pallid sturgeons, and the bald eagles that establishes biological/conservation goals for South Dakota and management actions to achieve those goals.
8. Will work cooperatively with SDGFP and the Service on a Habitat Conservation plan or some similar process for State actions.
9. Will participate with the Service and SDGFP on training Corps personnel for proper documentation on investigating potential violations of State and Federal law.

D. National Park Service (NPS):

1. On sites owned or managed by NPS, will close portions of the area where least terns or piping plovers are nesting, to include appropriate buffer zones.
2. On sites owned or managed by NPS, will buoy off least tern foraging areas if potentially impacted by watercraft traffic.
3. Will work cooperatively with SDGFP, the Service, and the Corps to develop a Missouri River Management Plan for least terns, piping plovers, pallid sturgeons, and bald eagles that establishes biological/conservation goals for South Dakota and management actions to achieve those goals.
4. Will work cooperatively with SDGFP, the Service, and the Corps on a Habitat Conservation plan or some similar process for State actions.
5. Will continue public outreach activities related to least terns, piping plovers, bald eagles, and pallid sturgeon at Missouri National Recreational River.
6. Will coordinate with SDGFP, the Service, and the Corps to conduct annual bald eagle nesting surveys from Fort Randall Dam to Ponca, Nebraska.

E. All signatory agencies:

1. Will participate in at least two meetings or conference calls per year, timed before the nesting season begins (to plan for the upcoming nesting season) and after the nesting season ends (to evaluate and report on success of cooperative efforts.) Other meetings or specific coordination will be scheduled as needed during the tern and plover nesting season or if other species management needs warrant an additional meeting.
2. Will participate in the identification of pallid sturgeon backwater restoration areas along the Missouri River below Gavins Point and Fort Randall Dam.
3. May assign special designation to areas under their authority for endangered species emphasis, as appropriate. For example, ownership of Blue Blanket Recreation Area will not transfer to SD Game, Fish and Parks on January 1, 2002. However, this area will be managed by the SDGFP Wildlife Division under a wildlife management lease agreement with the U.S. Army Corps of Engineers and will be designated as a least tern and piping plover recovery area to be managed specifically for the enhancement and recovery of nesting least terns and piping plovers.

4. Will participate in preparation of an annual accountability report, with SDGFP as lead agency for report preparation.

III. Principal Contacts

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|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ol style="list-style-type: none">1. U.S. Fish and Wildlife Service
Ralph O. Morgenweck
PO Box 25486 DFC
Denver, CO 80225
(303) 236-7920
(303) 236-8295 (fax)
ralph_morgenweck@fws.gov | <ol style="list-style-type: none">2. SD Dept. of Game, Fish and Parks
John L. Cooper
523 E. Capitol Ave.
Pierre, SD 57501
(605) 773-4229
(605) 773-6245
john.cooper@state.sd.us |
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IV. Agreement Term

This MOA will remain in force until November 8, 2006.

V. Approval

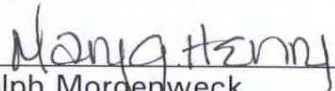
We, the undersigned designated officials, do hereby approve this Memorandum of Agreement.

Approved



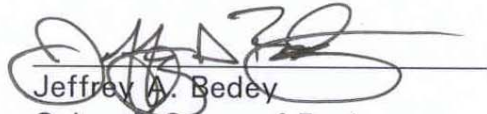
John L. Cooper
Secretary
SD Dept. of Game, Fish and Parks

Date 6/6/05

for 


Ralph Morgenweck
Regional Director, Region 6
US Fish and Wildlife Service

Date 6/23/05



Jeffrey A. Bedey
Colonel, Corps of Engineers
District Engineer

Date 6/14/05



Paul Hedren,
MNRR Superintendent
National Parks Service

Date 6.20.05