

AN UPDATE ON THE TRUMPETER SWAN REINTRODUCTION ON THE FLATHEAD INDIAN RESERVATION

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ABSTRACT

The Confederated Salish and Kootenai Tribes, in a cooperative project with Montana Fish, Wildlife and Parks, the U. S. Fish and Wildlife Service, and other cooperators, commenced a project to reintroduce Trumpeter Swans (Cygnus buccinator) on the Flathead Indian Reservation in 1996. Initial efforts involving translocation of Trumpeter Swans from Oregon and Alberta did not prove successful in establishing breeding swans. In 1999, the Tribes contracted with the Trumpeter Swan Fund and the Montana Waterfowl Foundation to produce swans in captivity for reintroduction efforts. Successes with captive propagation resulted in releases of 125 Trumpeter Swans from 2002-2007. The swans generally wintered in the lower Flathead River drainage and its tributaries, likely due to mild winter weather conditions, abundant open water and ample food resources. Collisions with overhead power lines were the major observed cause of mortality. Lines in areas of swan activity are being marked with visual diverters through a cooperative effort with the local electrical utility company. Initial wild-nesting Trumpeter Swans from the reintroduction project were observed in 2004, with increased breeding success in 2005-2007. Ongoing efforts include continued releases of captive-produced swans, monitoring of released swans, marking of additional power lines and monitoring reproduction.

INTRODUCTION

The Flathead Indian Reservation encompasses approximately 500,000 ha. The Reservation was established in 1855 by the Treaty of Hellgate, between the United States and the Salish, Pend d'Oreille, and Kootenai Tribes, as the permanent homeland of these tribes. The Reservation was opened to homesteading by non-Indian settlers in 1910. Since that time, many changes have taken place, the most notable of which is conversion of much of the lower elevation valley habitat from grassland and wetland habitats to agriculture. A substantial expansion of the human population, has also occurred. With these changes came substantial changes to the habitat of the Reservation and its native flora and fauna.

Trumpeter Swans (Cygnus buccinator) were apparently present as a breeding bird in western Montana prior to settlement of the area. The primary reference on trumpeter swans for western Montana and surrounding areas is Banko (1960). He noted a reference by Father Jean DeSmét in 1842, who observed that swan's eggs were collected by an

Indian hunting party near Flathead Lake (Thwaites 1906). Presumably, this reference dealt with resident breeding Trumpeter Swans. Other references of Trumpeter Swans in western Montana included observations by E. S. Cameron in 1881, which include descriptions of observations of nesting Trumpeters on the Thompson River in 1871 and on the South Fork of the Flathead River in 1889 (Coale 1915, Bent 1923). Little other early detailed documentation of breeding Trumpeter Swans in northwestern Montana during pre-settlement times apparently exists. Ball et al. (2000) documented the history and decline of Trumpeter Swans within the Rocky Mountain Population and discussed the difficulties anticipated with restoration of Trumpeter Swans in the Tri-State area of Montana, Idaho and Wyoming.

Regardless of their historical status in the Flathead River Drainage, Trumpeter Swans were apparently extirpated as breeding birds in the early 1900s, probably due to being utilized for subsistence by settlers and Native Americans alike. Presumably, the market for swan pelts and feathers also played a role in their decline, as evidenced by the Hudson Bay Company engaging in commercial hunting for swans (Linduska 1964). That author discussed the fact that, during the period of 1823-1880, some 108,000 swans were harvested, as compared with only 57 during the period of 1888-1897. Presumably, a substantial number of the swans harvested were Trumpeter Swans. The Hudson Bay Company maintained a trading post on the Flathead Reservation until the mid-1800s. Whether swans from the area were exported or market-hunted locally is unknown.

The susceptibility of Trumpeter Swans to disturbance and changes in the breeding habitat of the species that occurred during the settlement period also undoubtedly played a role in the demise of the species locally. The abundant wetlands of the Reservation were often drained and converted to agricultural fields and pastures.

The Confederated Salish and Kootenai Tribes of the Flathead Indian Reservation (CSKT) have developed a strong environmental protection and restoration record over the past three decades. The CSKT, through the Tribal Wildlife Management Program, have taken a strong, proactive approach with regard to wildlife management issues. One aspect of this approach is the CSKT's efforts in rare species management. Program personnel have been proactive managers of rare species ranging from amphibians to large carnivores.

Tribal wildlife management efforts have also focused on opportunities to re-introduce extirpated species of wildlife where current habitat and other conditions allow. These efforts have been successful for Peregrine Falcons (Falco peregrinus). Other projects to re-establish locally-extirpated species are also underway. These projects include reintroduction or population augmentation of the northern leopard frog (Rana pipiens) and planning for the possible reintroduction of Columbian Sharp-tailed Grouse (Tympanuchus phasianellus columbianus). This paper is an overview of efforts by the CSKT and other cooperating entities to re-establish the Trumpeter Swan as a breeding bird on the Flathead Indian Reservation. The CSKT view these lost species as missing pieces of the natural environment, and the reintroduction project discussed here is a means to re-establish this lost component.

PROJECT OVERVIEW AND UPDATE

Interest in the reintroduction of Trumpeter Swans in western Montana has been increasing for years. The development and subsequent revisions of the Management Plan for the Rocky Mountain Population of Trumpeter Swans provided a template for current reintroduction efforts (Subcommittee on Rocky Mountain Trumpeter Swans 1992, 1998). The Plan recommended actions that could be undertaken by wildlife management agencies and private organizations to re-establish the species throughout its original breeding range and coordinate these efforts in the development of a comprehensive approach to population surveys, population management activities (including population augmentation and reintroduction activities), public education and research needs. Additionally, interagency efforts to refine the focus of the Plan have resulted in the Pacific Flyway Council's Trumpeter Swan Implementation Plan (TSIP) (2002). The Flathead River Drainage is included in the discussion of potential reintroduction sites in both documents.

CSKT efforts in the reintroduction of Trumpeter Swans on the Flathead Indian Reservation officially began with Tribal Council approval of a reintroduction proposal in 1996 (Becker and Lichtenberg 2007). The completion of an environmental assessment for the project by the Tribal Wildlife Management Program and Montana Fish, Wildlife and Parks (MFWP) provided an opportunity for public review of the proposal, which resulted in an immediate and enthusiastic response and support from an interested public.

Initial efforts centered around the selection of suitable reintroduction sites on the Reservation. Wetland habitat there is diverse in nature and status. Wetlands range from small depressions with little or no seasonal water present to large reservoirs dedicated primarily to irrigation. These sites are owned and managed by the CSKT, MFWP, U. S. Fish and Wildlife Service (USFWS), and private landowners. In addition, concerns related to the potential for illegal shooting, hunter misidentification, fluctuating and unpredictable water levels, food availability, power line and fence collisions, lead poisoning, landowner concerns or opposition and other possible threats were evaluated as possible obstacles for the successful completion of the project.

Pablo National Wildlife Refuge was selected as an initial release site due to seclusion from excessive human activities, presence of abundant natural food resources, and the ability to control and maintain water levels. The refuge is situated on land owned by the CSKT and administered by the USFWS under an easement. Wildlife management activities on the refuge are coordinated by both entities. Refuge lands encompass a large irrigation reservoir and include a smaller adjacent impoundment constructed by Ducks Unlimited in the late 1980s to maintain water during the irrigation season. Surrounding habitat is largely mixed grassland, interspersed with native and introduced tree species. Similar habitats at two additional sites have also been utilized as release sites for swans.

Initial reintroduction efforts commenced in 1996 with the relocation of 19 Trumpeters from south-central Oregon. A subsequent reintroduction effort occurred in 1998, when 10 cygnets were in western Alberta and transported to the Reservation.

Although these two efforts indicated that the Reservation could support trumpeter swans during the summer, the failure of any of the released Trumpeter Swans to return to the Reservation in subsequent years was disappointing. In addition, the difficulties and uncertainties involved with obtaining an adequate number of wild swans for sustained releases resulted in limited confidence of maintaining the project to ultimate success.

Re-evaluation of the entire project clearly indicated a continuing strong interest by all of the partners and the public, but it also indicated a need to develop some means of insuring a more stable and reliable source of swans each year. In September 1999, the agency partners in the project agreed to support CSKT's development of a cooperative relationship with the Trumpeter Swan Fund (TSF) at Jackson, Wyoming. The TSF had a strong track record of captive reproduction of Trumpeter Swans at its facility and subsequent introduction of captive-reared swans to the wild.

With the assistance of the Lower Flathead Valley Community Foundation, the TSF was able to locate 24 adult and sub-adult Trumpeter Swans at a waterfowl breeding facility in Montana that were for available for use in the project. These birds were originally of Rocky Mountain Population origin and had come from the Tri-state area population. These swans were desirable as breeding birds to supply cygnets for the FIR project. Under a contract with the Fund, the CSKT were able to provide funding to obtain the birds and to assist the Fund in upgrading its facilities to expand its captive breeding efforts. In addition, the CSKT pursued a similar contractual agreement for captive propagation with the Montana Waterfowl Foundation (MWF) at Ronan, Montana.

To address concerns about the potential health of the captive swans, each bird was examined closely upon capture, blood samples were drawn from each for analysis, and all were quarantined before being allowed to come in contact with other captive or wild swans. After the birds were found to be in good health, examination of the genetic relationships of the birds was evaluated, and some were considered as surplus birds due to their close relationship with others in the group. As a result, some of the swans originally acquired have been traded for other captive Trumpeter Swans to reduce genetic duplication within the birds utilized in the project.

Initial success of the captive propagation project at the TSF occurred in 2000, and initial releases of some of these birds at the FIR occurred in 2002. Releases of 125 captive-reared Trumpeter Swans have since occurred since 2002 (Table 1).

Table 1. Releases of Trumpeter Swans at the Flathead Indian Reservation, 2002-2007.

<u>Year</u>	<u># Trumpeter Swans Released</u>
2002	34
2003	34
2004	0
2005	26
2006	20
2007	11
Total	125

Reintroduced trumpeter swans generally remained in the area following the departure of the migrants. Most wild swans of both species passed through the FIR by late December. Most of the released swans wintered on the lower Flathead River, approximately 25 km southwest of the release sites; however, some extended migratory movements were also recorded (Fig. 1). Birds that did migrate included two cygnets that were observed in northwestern Colorado (960 km southeast) during the winter of 2003-2004 and another cygnet that was killed by colliding with a power line near Sula, Missoula (160 km south) in March of 2004. In 2005, a four-year old swan was reported as having been killed in a power line collision near Bozeman, Montana (320 km southeast). An additional yearling was found dead near Shelly, Idaho (460km southeast) in 2006. A necropsy indicated aspergillosis as the cause of death. No additional observations of have been reported outside of the vicinity of the FIR.

Some dispersal of Trumpeter Swans to the north of release sites in subsequent years has been recorded. Individual swans have been reported near Somers, Montana (approximately 40 km north) and near Eureka (115 km North) during the summer of 2007, but these birds returned to the Reservation during the following winter. No other observations of swans from the project were reported from any other areas in western Montana or adjacent areas.

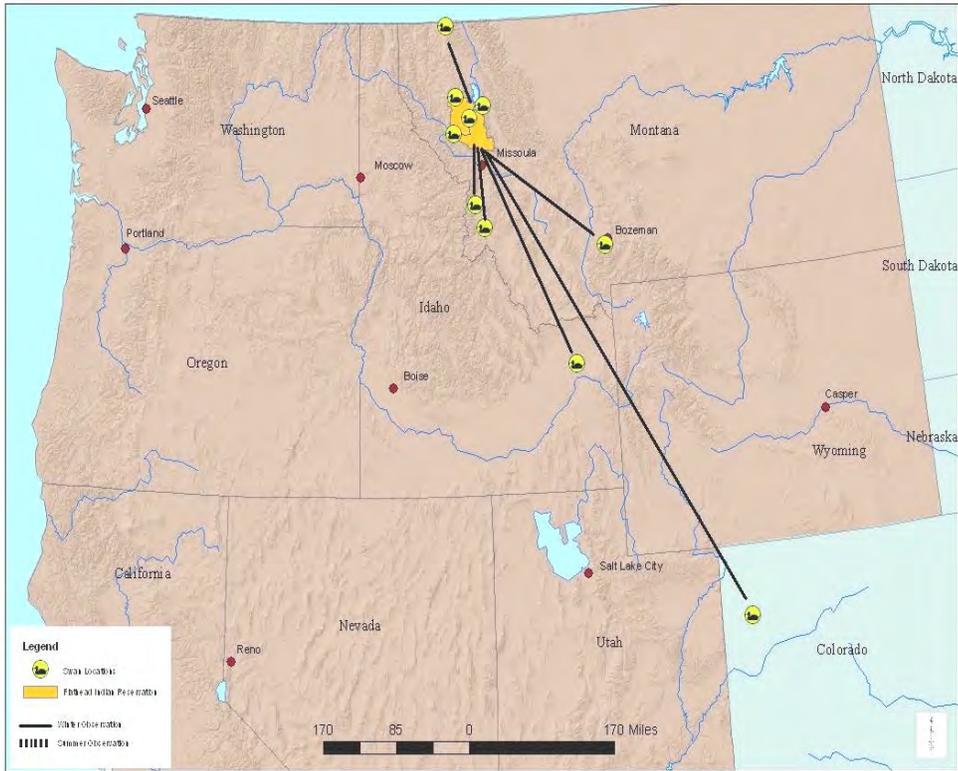


Figure 1. Map of Trumpeter Swan movements from the Flathead Indian Reservation.

Known mortalities of released Trumpeter Swans has been primarily due to collisions with overhead power lines, although collisions with fences and unknown mortalities have also been documented (Table 2).

Table 2. Causes of mortalities of Trumpeter Swans released in 2002-2005 on the Flathead Indian Reservation.

<u>Cause</u>	<u>2002</u>	<u>2003</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>Totals</u>
Power line	9	11	3	3	1	27
Fence	2	0	0	0	0	2
Lead poisoning	0	0	0	1	0	1
Entanglement	0	0	0	1	0	1
Disease	0	0	1	1	0	2
Unknown	3	6	5	2	0	16

Given the high level of swan mortality due to collisions with overhead power lines, the Tribal Wildlife Management Program initiated a project to mark power lines at locations of collisions and at other potential collision sites near regularly-used swan flight paths. This project identified seven sites. A review of existing literature and personal contacts with several swan experts with experience in collision reduction indicated good results in the form of decreased incidences of swan collisions with power lines after installation in areas in which Swan Flight Diverters (SFD) were used. The SFDs are oval-shaped spiral attachments approximately 40 cm in length and approximately 30cm in diameter that attach to and around the line and are manufactured to fit on lines of specific diameter. In the United States, these diverters distributed by P and R Technologies of Portland, Oregon. The object of diverter designs is to add visibility to the power line. No further collision-caused mortalities were noted at sites at which the diverters were installed, although local utility personnel expressed some concerns about the potential for icing during cold weather and line crossing due to wind.

To further attempt to reduce power line collision mortalities in swans, the Tribal Wildlife Management Plan applied for and received a Tribal Wildlife Grant from the U. S. Fish and Wildlife Service in 2005. The objectives of this grant were to 1) evaluate power lines that might pose the most significant threats to Trumpeter Swans; 2) prioritize marking of these lines for installation of diverters; and 3) install diverters in as many of the prioritized locations as possible.

All overhead power lines were mapped and created as a Geographical Information System (GIS) theme. These line locations were then evaluated with consideration of known swan flight routes between wetland habitats and along major tributaries and the lower Flathead River. These sites were then targeted for flight diverters during particular years based upon recent observations of trumpeter swan presence and activity.

A cooperative agreement was developed with the local electrical utility, Mission Valley Power, to facilitate installation of the flight diverters. The utility's evaluation of the spiral flight diverters installed earlier resulted in concerns about potential icing problems during periods of winter fog and the potential for wind conditions to cause crossing of lines caught by the diverters and potential outages. An evaluation of other potential line-marking products resulted in agreement that the design of Firefly Diverters (marketed by Swift Current Consulting, L. L. C. of Grantsville, Utah) seemed to both hold good potential for success in providing visibility of the lines, as well as addressing icing and line crossing concerns. To date, nearly all lines at which collisions have occurred in the past or at which they might be anticipated in the future have been marked, with final marking planned for the summer of 2008.

Trumpeter Swans released in 2002 began to form pairs during the autumn and winter months of the following years (Table 3). Nesting activity has been somewhat slow and gradual, but has recently increased.

Table 3. Summary of breeding pairs of Trumpeter Swans and productivity at the Flathead Indian Reservation, 2004-2007.

<u>Year</u>	<u># Pairs</u>	<u># Nests</u>	<u># Productive Nests</u>	<u># Cygnets</u>	<u>#Fledglings</u>
2004	6	3	3	7	7
2005	5	2	2	6	5
2006	5	2	2	7	7
2007	8	7	7	21	17

DISCUSSION

The Trumpeter Swan Reintroduction Project on the Flathead Indian Reservation has encountered both successes and setbacks since its inception. While reliance upon wild birds for release proved problematic in the early days of the project, the use of captive propagation to supply birds for release has helped the project to progress. The captive propagation program has produced cygnets in adequate numbers to support the project; however, a larger number of releasable birds would likely be available if propagation efforts could be increased. Work is currently underway to increase the number of genetically-appropriate captive breeding pairs at both participating breeding facilities.

Although released Trumpeter Swans have exhibited only limited migratory and dispersal movements, this lack of significant movement is not viewed as a setback for the project. The failure of the released swans to migrate from the Reservation could be expected, given that no swans that had previously migrated were present among the released birds. In addition, the mild local weather conditions, availability of a substantial number of open-water areas and an abundance of aquatic plant food resources provided good fall and winter habitats for the birds.

The high number of mortalities of Trumpeter Swans following releases was due largely to collisions with overhead power lines. To decrease these high mortality rates, an active effort to identify lines that have been the sites of collision mortalities and potential mortality locations is currently underway. Initial marking of overhead lines has proved encouraging in reducing mortalities, and these efforts are being expanded. Given the rapidly-increasing human development in the area, it is assumed that some mortality due to power line collisions will continue, but it should be manageable.

The initial success of breeding pair formation and nesting activity has been gradual, but the number of pairs actually nesting is low. It is encouraging to observe that,

during each year, additional pairs of trumpeters are forming for what will hopefully result in additional productive pairs.

The results of the reintroduction project to date are encouraging. Continuing efforts are expected to result in the establishment of a resident population of wild trumpeter swans on the Flathead Indian Reservation. This project, along with a similar reintroduction project being conducted in the nearby Blackfoot River drainage, has the potential to create Trumpeter Swan populations that will expand to other suitable habitats in western Montana.

ACKNOWLEDGMENTS

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Funding for the reintroduction activities was provided primarily by the CSKT. The 1997 activities were funded by the CSKT, in cooperation with the National Fish and Wildlife Foundation, the Liz Claiborne-Art Ortenburg Foundation and the Summerlee Foundation. Jeff Herbert, then MFWP Waterfowl Coordinator, assisted in securing Pacific Flyway Council concurrence with the proposed project and permits to initiate the project. Dr. I. J. Ball, former Montana Cooperative Wildlife Research Unit Leader provided ideas and advice throughout the project. David Wiseman, Bill West and Lindy Garner of the USFWS, provided logistical support and assisted with many aspects of the releases of the swans. Harold Knapp provided an inspiration, ideas and valuable insight from his many years of interest in trumpeter swans and his experience with wildlife management in the Flathead Valley. The late William Edelman, of the Lower Flathead Valley Community Foundation, assisted with acquisition of the captive swans for the project. Bill Long, of the Trumpeter Swan Fund housed and cared for the captive swans, oversaw all aspects of the captive propagation project and assisted with many logistical issues. John Jarvis, of the Montana Waterfowl Foundation was also involved with captive propagation efforts. Other cooperators included the Jerry Beyersbergen of the Canadian Wildlife Service, the Friends of Elk Island Society, and the staff of the Summer Lake Wildlife Management Area of the Oregon Department of Fish and Wildlife, who provided logistical assistance with obtaining swans for the 1996 and 1998 efforts, respectively. The interest and support of local residents, as well as their observations are also greatly appreciated.

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