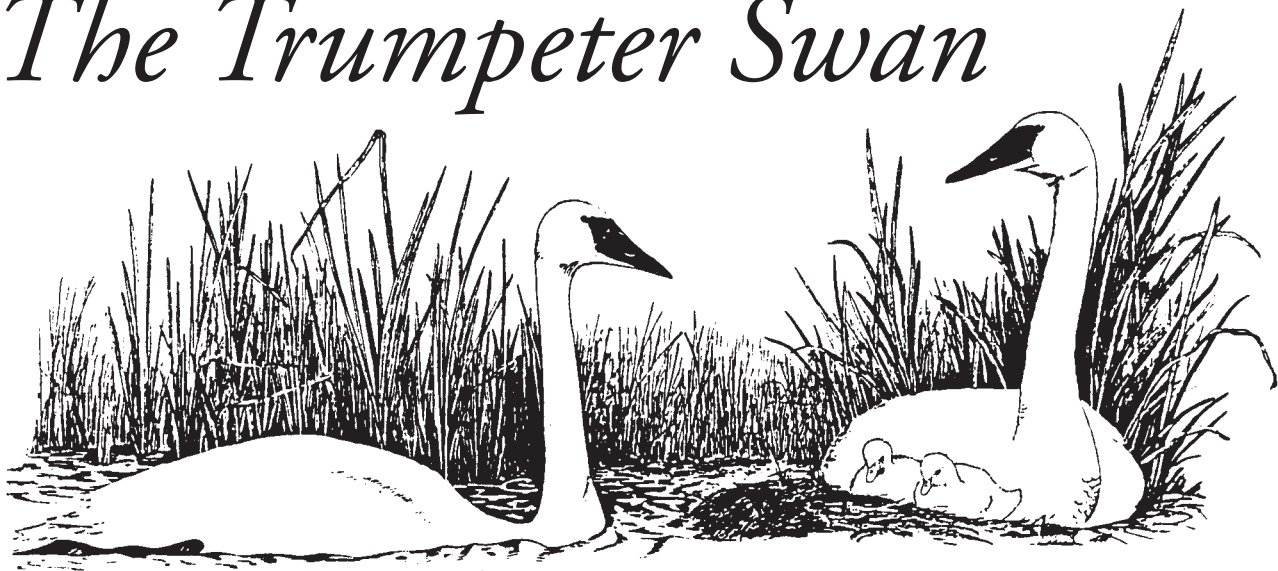


The Trumpeter Swan



by Sumner Matteson, Scott Craven and Donna Compton

Snow-white Trumpeter Swans present a truly spectacular sight. With a wingspan of more than 7 feet and a height of about 4 feet, the Trumpeter Swan (*Cygnus buccinator*) ranks as the largest native waterfowl species in North America.

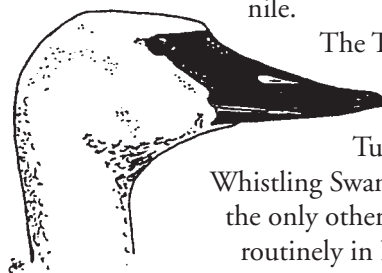
Because the Trumpeter Swan disappeared as a breeding bird in the Midwest, several states have launched restoration programs to reintroduce it to the region. This publication will provide you with background information on the Trumpeter Swan's status and life history, and on restoration efforts being conducted in the upper Midwest.

Swans of the Midwest

Trumpet Swans, along with ducks and geese, belong to the avian Order Anseriformes, Family Anatidae.

Trumpeters have broad, flat bills with fine tooth-like serrations along the edges which allow them to strain aquatic plants and water. The birds' long necks and strong feet allow them to uproot plants in water up to 4 feet deep.

Most Trumpeter Swans weigh 21–30 pounds, although some males exceed the average weight. The male is called a cob; the female is called a pen; and a swan in its first year is called a cygnet or juvenile.



Trumpeter Swan

The Trumpeter is often confused with the far more common Tundra Swan (formerly Whistling Swan, *Cygnus columbianus*), the only other native swan found routinely in North America. Tundra Swans can be seen in the upper Midwest only during spring and fall migration.

You can distinguish between the two native species most accurately by listening to their calls. Observers have described the Trumpeter's call as resonant, deep, loud, sonorous and trumpet-like—hence the bird's name. The Tundra Swan has a high-pitched, quavering call resembling that of a Canada Goose (*Branta canadensis*) or Snow Goose (*Chen caerulescens*). From a distance, the calls of a flock of Tundra Swans may be likened to the

sound of a pack of baying hounds, or distant “whoops and hollers.”

The Tundra Swan has a 6- to 7-foot wingspan, weighs 13–20 pounds, and stands about 3 feet tall. Both species are white with black bills. During their first summer, Trumpeter and Tundra cygnets have pink bills with black tips. Cygnets of both species are completely gray, gradually changing to white throughout their first winter and spring. Head, neck and flight feathers are the last to change color.

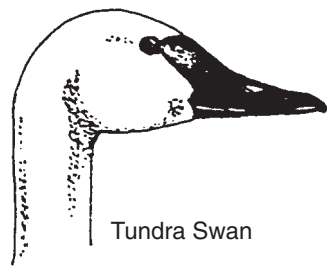
Tundra cygnets are silvery-gray as opposed to the darker-hued Trumpeter cygnets, which are sooty gray in the head and neck areas. The bills of both turn black during the first winter.

One notable difference between these two species is found in their head and bill profiles. The Tundra’s bill is slightly dish-shaped or concave, and smaller in proportion to its smoothly rounded head. The bill of the Trumpeter appears heavy and somewhat wedge-shaped in proportion to its large angular head—similar to the head profile of a Canvasback (*Aythya valisineria*).

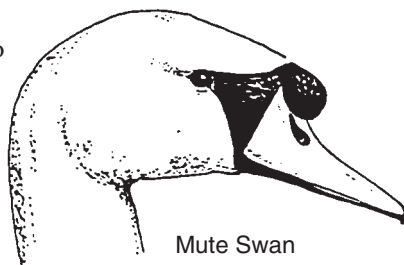
Some of the Tundra Swan’s other field characteristics include a distinct yellow spot in front of the eye found in about 80% of the birds. In contrast, the Trumpeter has a red border or stripe, like lipstick, on the edge of its lower mandible. However, you may occasionally observe a Tundra Swan with a red border on its bill, or a Trumpeter with a yellow mark in front of its eye. As mentioned earlier, the best way to distinguish between the two species is by their calls.

A third swan species is not native to North America.

The Mute Swan (*Cygnus olor*) is a Eurasian bird first introduced by European immigrants. This is the swan typically featured in art work and folklore. The Mute Swan is found commonly along the East Coast of the U.S. and in scattered locations in the Midwest. The Mute Swan is considered an undesirable exotic species that harasses native waterfowl and uproots large quantities of aquatic vegetation. Almost all North American breeding



Tundra Swan



Mute Swan

populations of Mute Swans were established by the escape or accidental release of captive birds.

Nearly the same size as the Trumpeter, the Mute Swan is easily distinguished from other swans by its orange bill and the prominent black fleshy knob extending from the base of its bill to its forehead. The Mute Swan typically holds its neck in an S-curve with the bill pointed downward. Though described as silent, Mutes actually utter a variety of call notes, including grunts and snorts.

Mute Swan cygnets have two distinct color phases: “royal” (brownish) and “Polish” (white). Unlike Trumpeter and Tundra cygnets, the Mute cygnet has either a dark (in the royal phase) or a pinkish bill, which turns orange during the first year.

Status and distribution

Trumpeter Swans were once fairly common throughout most of the northern U.S. and Canada (figure 1). Market hunting and the millinery trade rapidly depleted nesting populations during the 19th century. Thousands of swan skins (mostly from Trumpeter Swans) were sent to Europe where they were used to make ladies’ powder puffs, while the feathers adorned fashionable

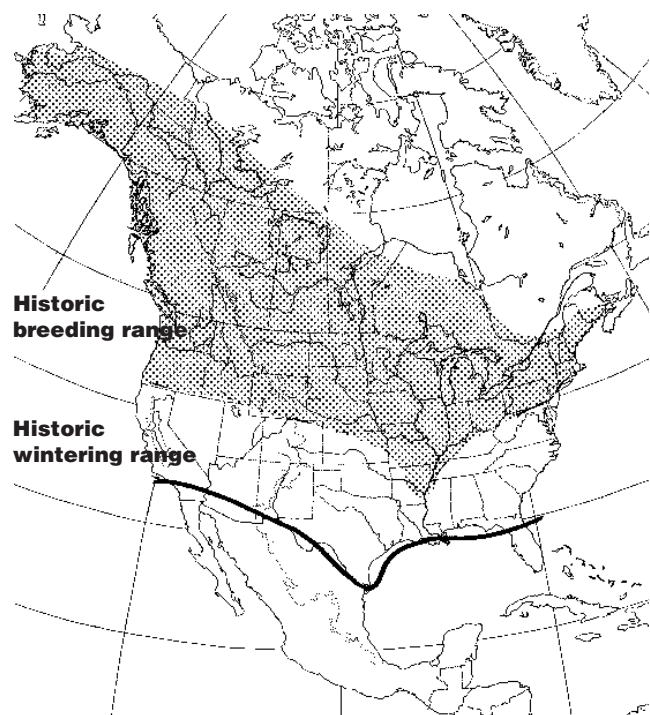


Figure 1. Historic breeding and wintering ranges of Trumpeter Swans. Compiled from the studies of Philip Rogers, Don Hammer, Harold Burgess, Harry Lumsden, Frank Bellrose, and Ralph Palmer.

hats. By the late 1800s, it was widely believed that the species had become extinct.

Fortunately, a small nonmigratory population survived in the remote mountain valleys of Montana, Idaho and Wyoming. Two nests were found in Yellowstone National Park in 1919; and in 1932, 69 Trumpeters were documented in the region.

In 1935, the U.S. government established Red Rock Lakes National Wildlife Refuge (NWR) in Montana's Centennial Valley to protect the remnant Trumpeter population. Managed by the U.S. Fish and Wildlife Service, habitat conditions quickly improved when refuge personnel restricted livestock grazing and hay cutting in marshes, protected the muskrat population (muskrat houses furnish nesting sites for Trumpeters), provided winter food, controlled predators, and more recently prohibited the use of lead shot and lead fishing sinkers to reduce the danger of lead poisoning.

With protection at Red Rock Lakes NWR and in the adjacent Yellowstone National Park, the Tristate (southwestern Montana, east central Idaho, and northwestern Wyoming) subpopulation of Trumpeter Swans increased to 640 birds by the late 1950s.

In an attempt to expand their range and improve their chances of survival, some Trumpeters were relocated from the Tristate area to a suitable habitat outside of the region. In 1938, four cygnets were taken to the National Elk Refuge in Jackson, Wyoming. Over the next 30 years, Trumpeters were moved to several national wildlife refuges as well as to the Midwestern site of Hennepin Parks in Minnesota. A total of 40 Trumpeters from Red Rock Lakes NWR formed the core of the Midwest's restoration effort in the late 1960s.

Between the mid-1960s and the mid-1980s, the Tristate subpopulation declined. Productivity plunged in the late 1970s, and by 1986 only 392 birds remained. Concern over the decline led to an extensive study that demonstrated a close relationship between swan survival and productivity and the availability of winter food supplies (native foods and supplemental grain) at Red Rock Lakes NWR. The policy of providing supplemental feed on NWR lands, however, led to erratic artificial feeding practices. Because Red Rock Lakes NWR was designed to promote the welfare of Trumpeter Swans, it was determined that Trumpeters wintering in the Tristate should be redistributed. Plans to achieve that objective are currently underway.

We now know that in the 1930s, when Red Rock Lakes NWR was established, remnant Trumpeter Swan flocks survived in remote parts of Alaska and western Canada. Those flocks have grown substantially and now comprise the most secure population of Trumpeters in North America.

For management purposes, Trumpeters are divided into three populations based on where they breed and spend the winter (figure 2). The Rocky Mountain population is composed of two subpopulations: the Canadian flock that migrates to the Tristate for the winter, and the Tristate Subpopulation, a year-round resident flock. These two subpopulations total approximately 2,500.

There are nearly 15,000 Trumpeter Swans in the Pacific Coast Population of Trumpeter Swans. Most of these birds nest in Alaska and winter along the coasts of British Columbia and Washington.

The third population, the Interior Population, includes all Trumpeters east of the Rocky Mountains. All of these birds have been part of restoration projects and are widely distributed.

Since the first recovery efforts in the 1960s when Trumpeters were all but extinct, until now, with the bird population totalling nearly 900, major strides have been made in restoring the species to the continental interior.

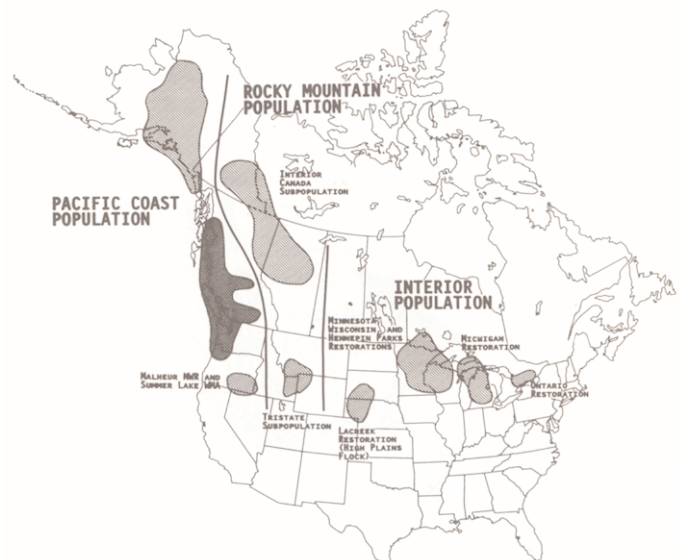


Figure 2. Current regional populations of Trumpeter Swans.

Breeding biology

Trumpeter Swans may form pair bonds as early as their second winter. A number of Wisconsin's restoration birds have successfully nested for the first time at 2 years of age. A far greater number of Trumpeters, however, first nest when they are 3–6 years old. Trumpeter Swans mate for life and may live for 20 years or more. If one member of a pair dies, the survivor finds another mate.

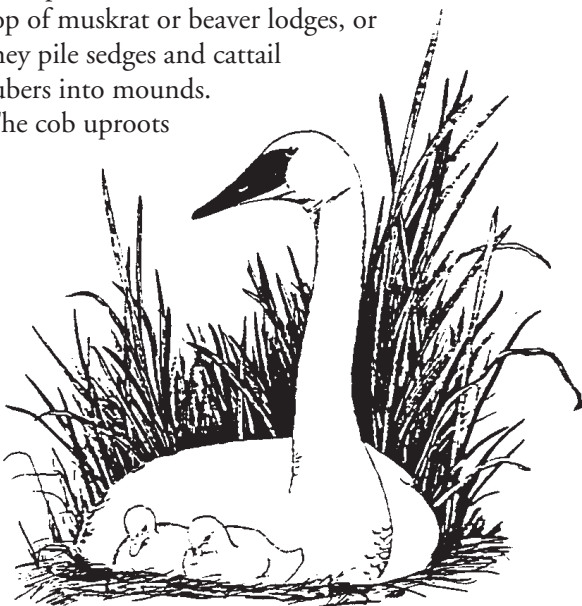
Swans usually form pair bonds on the wintering grounds. Pairs may select the same nesting area where the pen hatched. The pen chooses the specific nest site and the cob defends it, sometimes joined by the pen. If a pair spends at least two summers at the same nesting location, it will form an almost unbreakable attachment to the site.

A Trumpeter pair typically arrives on the breeding grounds even before the ice melts in early spring. For the first few weeks after their arrival, the swans engage in courtship behavior—bobbing their heads and quivering their wings as they face each other.

Trumpeter Swan nesting territories range anywhere from 6–150 acres. Large, shallow wetlands 1–3 feet deep, with a diverse mix of emergent vegetation and open water, offer ideal habitat. Such locations support a rich variety of submergent (underwater) plants used for food, such as sago pondweed and water milfoil. Trumpeters prefer these, along with emergent plants such as arrowhead, bur reed, bulrush, sedges and wild rice.

Nest building begins in mid-April and lasts 1–2 weeks. Nests may reach diameters of 6 feet or more. Trumpeters often build their nests on top of muskrat or beaver lodges, or they pile sedges and cattail tubers into mounds.

The cob uproots



vegetation and transfers it to the pen, who piles it high and then uses her body to form a depression for her eggs. The same nest may be used year after year. It is usually surrounded by water, making it difficult for mammalian predators to surprise the pair.

Beginning in late April or early May, the pen lays one off-white egg (4 ½" long and 3" wide) every other day until the clutch of 5–9 eggs is complete. The pen incubates the eggs and the cob protects the nest against all intruders, including Canada Geese.

During the incubation period (33 days), the pen occasionally leaves the nest to feed, bathe and preen her feathers. Preening is vital to maintaining the bird's plumage. While preening, a Trumpeter presses its bill against the base of its tail to extract a greasy fluid from an oil gland. This oily fluid reconditions, cleans and waterproofs the swan's feathers.

When the pen leaves the nest, she covers her eggs with nest material. The cob, meanwhile, stands guard on or near the nest to deter predators, vigorously chasing away intruding swans or other wildlife. The adults perform a "triumph display" after intruders are repelled. Facing one another, they quiver their wings and trumpet loudly.

When the cygnets hatch in late May or early June, they weigh about seven ounces. After a day or two, they take to the water to feed on aquatic plants and invertebrates. In the early stages of development, cygnets may gain 20% of their body weight every day. By the time they are 4–6 weeks old, they feed on aquatic vegetation, uprooting plants with their bills as their parents do.

Shortly after the cygnets hatch, the female molts, shedding and replacing flight feathers on her wings and tail. The cob molts after the pen has regrown her flight feathers. The molting period lasts about 30 days for each bird. Because adult swans are vulnerable to predators during this flightless period, they seek shelter in tall emergent vegetation. The staggered molt means that at least one adult is always capable of flying and defending the cygnets.

The cygnets grow rapidly. Scapular, tail and flank feathers begin to replace gray down when the cygnets are 4 weeks old. At 6 weeks, the belly, breast and cheek are fully feathered. By 7 weeks, cygnets have most of their neck and crown feathers. Cygnets are fully feathered by 9–10 weeks, although they are unable to fly until they are about 15 weeks of age. At 15 weeks, the cygnets weigh around 20 pounds, having grown more than a pound a week!

A cygnet's first flight in late September is ordinarily short. Daily practice prepares cygnets to migrate with their parents just before the temperature reaches freezing. Family groups and mated pairs keep to themselves on the wintering area, although they may be part of a larger congregation of swans. Parents and their cygnets return year after year to the same winter feeding sites. The quality and quantity of winter foods influences productivity during the next breeding season.

Cygnets remain with their parents throughout their first winter, migrating with them back to the breeding area. Shortly afterwards, cygnets are driven away by their parents. They remain together in sibling groups until about 2 years of age when they seek mates and a new life in a remote marsh.

Swan hunting

Trumpeter Swans, though protected from hunting throughout their range, are sometimes shot by mistake. Snow Geese, hunted in some areas frequented by Trumpeters, are significantly smaller, with a wingspan of only about 3 feet and prominent black wing tips. The Tundra Swan is hunted in North Carolina, Virginia, North and South Dakota, Montana, Nevada and Utah. Where both Tundra Swans and Trumpeters dwell, Tundra Swan hunts are limited to areas and times when Trumpeters are not commonly present.

Midwestern swan restoration programs

Dwindling Trumpeter Swan populations have impelled some Midwestern states to launch restoration programs to reintroduce the birds. So far, the results of these programs have been encouraging.

Minnesota's Hennepin Parks pioneered the effort to reestablish Trumpeter Swans in 1966. By the 1980s, the state natural resources' agencies of Wisconsin, Minnesota and Michigan had initiated Trumpeter Swan recovery programs. In 1994, Iowa began a cooperative restoration project. Working together, these states are now establishing flocks that will help create a breeding and migratory population of Trumpeter Swans in the Midwest. Wisconsin, Minnesota (including Hennepin Parks), Michigan and Iowa (as well as the province of Ontario) are attempting to reestablish Trumpeter Swans by rearing cygnets in captivity. After 2 years, unrelated birds are paired and released at selected wetlands. Birds are kept in captivity for 2 years because it is believed that survival is

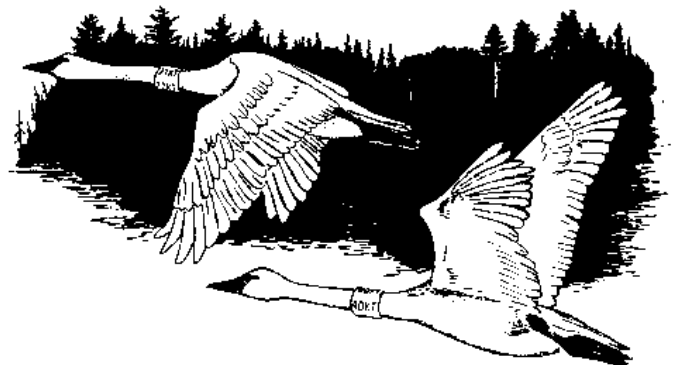
most difficult in the cygnet's first 2 years of life. Released birds usually "imprint" on the release area; that is, they are most likely to return to that area to nest at age 3 or older.

The sites where cygnets and yearlings are held are called captive-rearing or overwintering sites. Wisconsin, for example, has 3 such sites where Trumpeter cygnets are maintained. To prevent the swans from flying away, their wings are clipped in the summer. Within a year, the swans molt and regrow their flight feathers, necessitating another clipping since the young swans must remain at the overwintering site for a second year.

Another important approach in restoration efforts is that of maintaining flightless, breeding pairs that contribute young to the restoration programs. Several zoos, game farms, private propagators, and the Delta Waterfowl Research Station in Manitoba, Canada, have provided cygnets for Midwestern restoration programs. These cygnets are held in captivity for 1–2 years, then released at selected sites.

To determine the most effective techniques for achieving a wild, free-flying Trumpeter Swan population, Wisconsin initiated research in 1989 to compare the release of 2-year-old birds with the release of cygnets imprinted on a swan decoy. Decoy-reared cygnets learn to avoid potential predators through responses to taped vocalizations from a swan decoy. The cygnets live in a remote marsh setting for about 4 months until they can fly. They are then allowed to fly free as they would in the wild. Preliminary results suggest that decoy-rearing is an effective technique in establishing breeding pairs as early as 2 years of age.

Observations on live birds and the recovery of dead birds provide wildlife managers with valuable data on swans' movements and survival. To monitor the survival and movements of released swans, Minnesota biologists attach orange wing tags with black numbers on each bird released. Wisconsin and Hennepin Parks have used yel-



low collars with black letters and numbers, but they are currently using green collars with white alpha-numeric codes. Michigan and Ontario also use green wing tags, and Iowa will mark its birds with either wing tags or collars. This allows individual birds to be identified from a considerable distance. Each bird is also banded with a U.S. Fish and Wildlife Service leg band prior to release.

Minnesota

Hennepin Parks began its restoration program with a pair obtained from Red Rock Lakes National Wildlife Refuge in 1966, and is now well on the way to reaching its goal of establishing a free-flying flock of 150 trumpeters, including 20 nesting pairs, in central Minnesota.

The Minnesota Department of Natural Resources (MDNR) began its Trumpeter Swan Recovery Program in 1982. From 1986 through 1988 it annually collected and incubated 50 Alaskan Trumpeter Swan eggs. By 1994, the project raised and released 215 Trumpeters and estimated a total free flying flock of 250 in western Minnesota and beyond. The goal of the Minnesota DNR's recovery program was to establish a minimum nesting population of 15 pairs in the western part of the state. That goal has been achieved, and the project has changed its focus to southern Minnesota, where swans will be released in the Iowa-Minnesota border area.

Wisconsin

The Wisconsin Department of Natural Resources (WDNR) began its Trumpeter Swan Recovery Program in 1987 in cooperation with the Milwaukee County Zoo, the Wisconsin Metro Audubon Society, and the MDNR.

In 1987 and 1988, Wisconsin attempted to hatch 35 Trumpeter Swan eggs using mute swans as foster parents (a technique called "cross-fostering"). Twenty-six of the eggs hatched, but snapping turtle and possibly mammalian predation, as well as an aggressive adult male Mute Swan at one nest, meant that only two cygnets survived to flight. Cross-fostering was abandoned and replaced by decoy-rearing in 1989.

Following the procedure used by the MDNR, Wisconsin began collecting Trumpeter Swan eggs in Alaska in 1989, with 1996 the last scheduled year. At least two fertile eggs were left in each Alaskan nest, allowing each pair of swans to raise a brood. From 1989 through 1995 a total of 295 eggs were collected; 272 (92%) eggs hatched. During this period, 242 Trumpeters were released in Wisconsin.

In 1995, 11 pairs nested in Wisconsin. The goal of the WDNR recovery program is to achieve a population of at least 20 breeding and migratory pairs by the year 2000.

Michigan

The Michigan Department of Natural Resources began its Trumpeter Swan restoration program in 1986 in cooperation with Michigan State University's Kellogg Bird Sanctuary, several zoological parks, private aviculturists and habitat foundations. Reintroduction methods included cross-fostering with feral Mute Swans; releasing 2-year-old swans from Alaskan and avicultural stock; and selectively placing pinioned pairs from which the young were allowed to fly free.

From 1986 through 1989, a total of 44 Trumpeter Swan eggs were placed under feral Mute Swans. Thirty-one of these eggs hatched, but only six cygnets survived to flight, with nesting failures attributed largely to predation and parental abandonment. Michigan has also discontinued cross-fostering.

From 1989 through 1994, 134 Trumpeters were released in Michigan. Two release areas were selected, one in the Upper Peninsula in and around Seney National Wildlife Refuge and the other in southwestern Michigan near Kalamazoo.

The goal of Michigan's recovery program is to establish two flocks of 100 swans each by the year 2000.

Iowa

The Iowa Department of Natural Resources (IDNR) plans to release Trumpeters in northwestern Iowa from 1995 through the year 2003. The recovery goal of the Iowa program is to establish a self-sustaining, migratory population of Trumpeters with at least 20 pairs established in the state's prairie pothole region by the year 2003.

Iowa plans to raise cygnets in captivity through private cooperators and zoos and place the adult birds on "safe" ponds to be used as decoys for free-flying birds during the fall migration. A novel experiment will be conducted with the goal of teaching captive birds a route between suitable breeding habitat in northwestern Iowa and lead-free wintering areas in southern Iowa. The birds will be trucked between sites in the spring and fall each year until they are released. Decoys (future year's releases) will be placed on the same ponds to see if the captive-raised and released birds return.

The Iowa project will also assist in the effort to provide suitable wintering habitat in southern Iowa for Midwestern restoration swans.

Threats to restoration efforts

Though attempts to bring Trumpeter Swans back to the Midwest have seen some success, there are still a number of factors that could negatively affect restoration programs. Some of those include:

- **Lead poisoning** that occurs when swans ingest lead shot or lead fishing sinkers in wetlands and lakes. This problem looms as the single greatest threat to the reestablishment of Trumpeter Swans in the Midwest. Trumpeters swallow lead shot or sinkers as they feed on grit from the bottom (grit aids swans' digestion). The number of lead shot or sinkers within reach of the feeding swans increases during widespread drought and may present less of a problem in normal and wet years. Hennepin Parks restoration efforts have been hampered significantly by lead poisoning. Although a ban on the use of lead shot to hunt waterfowl went into effect nationwide in 1991, experiences with lead-poisoned waterfowl in wetlands that have not been hunted for more than 30 years show that the problem of lead poisoning will be with us for many years to come.
- **Illegal shooting** poses another serious threat. Trumpeters are protected from hunting in the U.S., and Tundra Swans are protected from hunting in the Mississippi Flyway. Public education campaigns that emphasize the differences between swans and Snow Geese will help, but in general, it is wanton shooting, not hunting, that causes the problem. Nevertheless, hunters need to know the differences between Trumpeter Swans and other waterfowl to prevent accidents.
- **Power lines** have been responsible for some Trumpeter Swan casualties. Where such lines cross heavily used wetlands or riverways, collisions can take place when birds fly low. With cooperation from power companies, markers can be installed on wires to help minimize this problem.

- **Loss of wetland habitat quantity and quality** could affect the long-term growth and stability of Trumpeter Swan populations. Wetland loss due to drainage and filling, heavy concentrations of lead shot or sinkers, or invasions of Mute Swans, carp, or purple loosestrife could limit the amount and quality of habitat available to nesting and wintering Trumpeters. The federal policy that mandates "no net loss of wetlands" implemented in 1989, along with the North American Waterfowl Management Plan, should help wetland conservation efforts. Public involvement in establishing and understanding wetland values is crucial to the long-term success of Trumpeter Swan restoration programs.
- **Predation** of cygnets by snapping turtles, Great Horned Owls, mink, raccoons, coyotes and red fox is always possible in the wild, as is mammalian and avian predation on juvenile or adult swans. Such predation is not considered a significant limiting factor anywhere on the continent, however.
- **Lack of funding** for Trumpeter Swan restoration efforts presents a different—though significant—problem. The Minnesota DNR calculated the cost to restore Trumpeter Swans to the state over a 9-year period at approximately \$300,000. This amounts to about \$2,000 per swan released. This project and similar programs in Hennepin Parks, Wisconsin, Michigan and Iowa are largely dependent on citizen donations and contributions from private corporations and organizations. The Pittman-Robinson Federal Aid-In-Wildlife Restoration Act has also been an important source of financing for Trumpeter Swan restoration.

What you can do

You can help in the effort to restore Trumpeter Swans to the Midwest by learning the differences between Trumpeters and other waterfowl, and by reporting your observations to local conservation officials or DNR office. Such information helps biologists track Trumpeter movements and prevent illegal harassment and killing of swans.

You may also want to join the Trumpeter Swan Society which is dedicated to restoring the Trumpeter Swan to as much of its former range as possible.

Finally, your support of voluntary conservation measures, such as the tax check-off on your state income tax form, or a direct contribution to your state's Trumpeter Swan restoration program, will help reestablish this majestic bird in the Midwest.

Below is a list of agencies and organizations you can contact for more information.

- The Trumpeter Swan Society and Hennepin Parks
3800 County Road 24
Maple Plain, MN 55359
(612)476-4663.
- Iowa Department of Natural Resources
1203 North Shore
Clear Lake, IA 50428
(515)357-3517
- Michigan Department of Natural Resources
Wildlife Division
Box 30028, Lansing, MI 48909
(517)373-1263
- Minnesota Department of Natural Resources
Division of Wildlife, Box 7
500 Lafayette Road, St. Paul, MN 55146
612)296-3344
- Wisconsin Department of Natural Resources
Bureau of Endangered Resources
Box 7921, Madison, WI 53707
(608)266-7012.

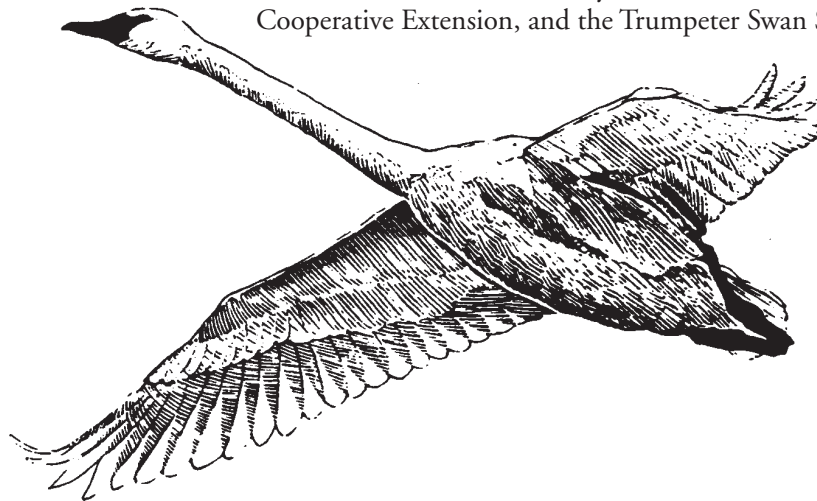
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