



## Tundra Swan

The tundra swan (*Cygnus columbianus*), formerly known as the whistling swan, breeds in northern Alaska and Canada and migrates south to spend the winter along and near the Pacific and Atlantic coasts. Tundra swans fly across Pennsylvania in spring and fall, and some individuals winter in the southeastern part of the state. Two other types of swans may be seen in Pennsylvania: the trumpeter swan (*Cygnus buccinator*), a native migratory species that has been reintroduced in the upper Midwest and Ontario; and the non-native mute swan (*Cygnus olor*), imported from Europe. Swans seen nesting in Pennsylvania are mute swans.

### Biology

The tundra swan is four to five feet long and has a wingspan of about 66 inches. It is markedly smaller than both the trumpeter swan and the feral mute swan. Adult tundra swans weigh approximately 10 to 18 pounds, with males somewhat larger than females. The plumage is white, and the sexes look alike. The bill and the front portion of the face are black (trumpeter swans are similar in this respect, while the mute swan has an orange bill with black knobs at the base). Most adult tundra swans have a yellow spot in front of the eye; trumpeters lack this feature. The legs are black. The neck is held straight up most of the time (the mute swan, in contrast, usually keeps its neck in a curved position).

Whether taking off from water or land, before a tundra swan can become airborne it must take many running steps. Individuals can fly up to 50 miles per hour. The flight call consists of one to three syllables, usually described as variations of the sounds *ou*, *oh*, and *oo*. The voice of a tundra swan sounds fairly similar to that of a Canada goose. Parents and young make softer *kuk kuk* sounds to communicate at close range.

Tundra swans are good swimmers, propelling themselves with their webbed feet. They can dive beneath the water if necessary.



As their name implies, tundra swans breed in the treeless tundra of northern Alaska and Canada's Northwest Territories, Nunavut, northeastern Manitoba, northern Ontario, and northwestern Quebec. The highest breeding concentrations occur in the river deltas of Alaska and the Northwest Territories. Swans that breed east of Point Hope in northern Alaska winter on the Atlantic coast, while birds breeding from Point Hope south winter along the Pacific. Tundra swans are managed as two separate populations – eastern and western – based on their wintering ground affiliations.

On their northern breeding range, tundra swans eat a variety of plants, including sedges, pondweed, pendant grass, arrowleaf, and algae. They consume seeds, stems, roots, and tubers. They also eat a few invertebrates. While floating on the water, tundra swans feed by dabbling with their bills. They also tip their tails upward, submerge their heads, and extend their necks to nip off vegetation as deep as 3 feet below the surface.

Males and females mate for life, forming a monogamous bond. On the breeding range, a pair maintains a territory in which they feed, nest, and rear young. The territory usually includes part of a large body of water, used for feeding and escaping from predators. A typical territory covers an area of about half a square mile. Young pairs may establish home areas a year or more before breeding. Each year, a pair will use the same territory, defending it against other tundra swans and waterfowl including Canada geese, white-fronted geese, snow geese, and long-tailed ducks. When it encounters a competitor, a swan may hiss, stare, raise its wings, and, use the wrist portion of its wings to deliver blows to the intruder's head and body.

The male and the female jointly build a nest out of grasses, sedges, lichens, and mosses. The nest is located on the ground, usually on an island or a low ridge or some other spot providing good visibility. The mound-shaped nest is one to two feet across, with a depression in the center. A pair may reuse the same nest in successive years. Tundra swans court by facing each other, spreading and quivering their wings, and calling loudly. Mating takes place in the water. The female lays three to five (rarely as many as seven) creamy white eggs. She broods her clutch the majority of the time; the male broods only when she is absent. After 31 to 32 days, the eggs hatch. Pairs produce only one clutch per season. If the nest fails, no second clutch is laid.

Young swans, called cygnets, are light gray in color. Their eyes are open when they pip the shell. Their downy feathers dry out a few hours after hatching, and they begin walking about near the nest. Around 12 hours after the last egg hatches, the parents lead the cygnets to water. With the young swimming along behind, the adults use their feet to kick loose and churn up plants on which the cygnets feed. For about a week after hatching, the parents may brood the young. Tundra swans sleep almost exclusively on land during the breeding season; they stand or sit and may rest their head on their back or tuck it partway under a wing.

On the breeding grounds arctic foxes, red foxes, brown bears, wolves, golden eagles, jaegers, gulls, and ravens prey on eggs and cygnets. Parents defend their eggs and young against smaller predators. Swans usually flee their nest when a large predator, such as a bear or a human, is still several hundred yards away. This strategy may make the nest harder to find. Adults molt their flight feathers during late summer. While molting, they cannot fly. If threatened by a predator, a swan will walk or run to the nearest large pond or lake and swim out to the center.

Cygnets are able to fly after two to three months. As the northern summer dwindles, family groups vacate their home territories and fly to staging areas, mainly along brackish shores of river deltas, which remain free of ice longer than other arctic wetlands. In late September, flocks begin heading south. Flocks are composed of multiple family groups and can number more than 100 individuals. The swans fly in V-formations at altitudes of 1,800 to 4,500 feet and higher.

Flocks follow traditional inland migratory routes. The eastern wintering population arrives in early October in the Devils Lake area of North Dakota and the upper Mississippi River in Minnesota. Later, flying by day and night, they make a nonstop migration of almost a thousand miles to wintering areas in coastal New Jersey, the Susquehanna River Valley in southern Pennsylvania, the Chesapeake Bay region, and coastal North Carolina. Some birds winter in the Great Lakes region. Tundra swans arrive at the wintering grounds from mid-November to mid-December. Banding studies indicate that individuals often return to the same wintering area year after year.

Tundra swans winter on shallow tidal estuaries and on freshwater lakes, ponds, and rivers. In the past, tundra swans fed largely on submerged aquatic vegetation, as well as a small amount of animal matter, including clams. As aquatic plants have dwindled due to the destruction of wetlands, wintering swans have shifted to feeding on land. They forage mainly in farm fields, picking up waste corn and soybeans left after the harvest, and eating crops such as winter wheat, rye, and barley. In winter, tundra swans spend the night floating and sleeping on the water. During the full moon, flocks may feed at night. They fly back and forth between resting and feeding areas.

Individual birds tend to lose weight over winter. Studies have shown that adult males may lose 14.5 percent and adult females 18.7 percent of their body weight. When they fly north in the spring, they are at their lowest body weight for the year. Flocks typically leave wintering areas between late February and mid-March and head north by stages. As much as 25 percent of the eastern population stops in the Susquehanna River Valley, where they feed heavily and accumulate energy reserves for migration and later breeding. They depart from the area later in March and move on to the next staging area in southern Ontario. They migrate through Wisconsin, Minnesota, and North Dakota in April, and usually arrive on the arctic breeding grounds by mid-May. Although family groups depart from wintering areas together, parent birds arrive on the breeding grounds unaccompanied by their young.

Tundra swans are long-lived. The oldest known individual was a banded bird that lived at least 23 years. Scientists estimate that 92 percent of adults, 81 percent of juvenile males, and 52 percent of juvenile females survive each year. One study found a 52 percent survival rate for young eastern tundra swans during their first migration.

## Habitat

During spring and fall migrations, tundra swans stop to rest and feed in estuaries, shallow ponds, lakes, and marshes fringing rivers. They also set down in harvested fields and fields in which winter grains are growing. The Arctic breeding habitat includes many lakes, ponds, pools, and wetlands.

Wildlife biologists believe that migratory staging areas are important late winter and early spring habitats in which



swans feed heavily and accumulate energy reserves for the coming breeding season. In Pennsylvania, most tundra swans winter along the lower Susquehanna River and at the Game Commission's Middle Creek Wildlife Management Area in northern Lancaster County. Many birds in the species' eastern wintering population stage in these areas. Some tundra swans also may winter along the Lake Erie shore near Presque Isle State Park.

## Population

During the late 1800s, the tundra swan population was at an ebb, probably because of unregulated shooting by market hunters. Following the 1918 Migratory Bird Treaty, swan numbers increased. *Cygnus columbianus* was thought to have been extirpated from breeding areas in the southern Hudson Bay region, but the species has recently begun nesting there again, along the coasts of Manitoba, Ontario, and Quebec.

Since the late 1960s, as aquatic plants have declined and mute swans (which compete with tundra swans for preferred habitats) have increased in number in the Chesapeake Bay, the number of tundra swans wintering on the Chesapeake has fallen. A greater percentage of the population now winters in North Carolina, where flocks feed extensively in agricultural fields.

Since 1984, some states have allowed a limited hunting season on tundra swans. In the East, Delaware, North Carolina, and Virginia issue hunting permits for swans. Tundra swans may not be legally hunted in Pennsylvania. The North American Waterfowl Management Plan, a guidance document for waterfowl conservation efforts across the continent, includes target population sizes of 80,000 tundra swans in the East and 60,000 in the West. Today both populations of *Cygnus columbianus* exceed these targets and are considered stable.

