



Snow Goose

The snow goose, *Anser caerulescens*, is one of the world's most abundant waterfowl species. Snow geese breed in the arctic and subarctic regions of North America and Russia during spring and summer, then migrate south to spend the winter in inland and coastal areas, including Pennsylvania. They feed voraciously on vegetation, and recent population increases have led to serious damage of the species' habitat, mainly on its breeding range but also in some wintering areas.

Biology

A medium-size goose, the snow goose is 27 to 33 inches long, with a wingspread of about 54 inches. It has a chunky body and weighs from 3.5 to 7 pounds, with males slightly heavier than females.

Anser caerulescens has two distinct subspecies, the greater snow goose and the lesser snow goose. The lesser snow goose is dimorphic, which means it comes in two different colors phases, a white phase and a blue phase. The white phase is all white with the exception of black primary wing feathers. On the blue phase, the head and front of the neck are white, and the body is gray-brown, with white or gray underparts. Intermediate color forms also occur. Juvenile snow geese often have gray feathers rather than white. On all snow geese, a black patch on the edges of the bill suggests a grin or smile when viewed from the side. The eyes are dark, the bill is pink, and the legs are dark pink. White individuals sometimes show rust-colored stains on the head and neck, caused by the birds' grubbing for food in muddy ground.

Greater snow geese are the primary subspecies wintering within Pennsylvania and historically were the only subspecies wintering in Pennsylvania. The lesser snow goose's U.S. wintering range has traditionally been a column sweeping from north to south through the Midwest part of the country and not reaching as far east at Pennsylvania. However, the range of the lesser snow goose continues to expand and blue phase geese are being seen more frequently on Pennsylvania wintering grounds. Recent estimates suggest as many as 20 to 30 percent of the snow geese now wintering in Pennsylvania are lesser snow geese.

Snow geese are good swimmers. They do not normally dive to find food but can submerge to evade predators. They walk



readily on land and run swiftly. They sleep floating on the water, or on land, sitting down or standing on one leg; the head is held low or tucked partway beneath one wing. Strong fliers, snow geese can reach air speeds of 50 miles per hour. Snow geese are extremely vocal. Individuals sound a *whouk* or *kowk*, given repeatedly in flight and on the ground and resembling the shrill barking of a dog. When feeding, snow geese make quieter *gah* notes. Parent birds utter *uh-uh-uh* vocalizations to their goslings.

Snow geese feed in shallow water and on the ground, typically in saturated soil. On their breeding grounds they eat leafy parts of grasses, sedges, rushes, and other aquatic plants, and grub out the roots and tubers of a variety of land plants and shrubs. En route to and on the southern wintering grounds, they dine on aquatic grasses, sedges, and rushes; berries; corn, wheat, barley, and other grains gleaned from harvested

fields; and pasture grasses and leafy stems of crops such as winter wheat and rice. In winter, snow geese feed from two to more than seven hours per day. In spring, when building up fat reserves for migration, they may feed more than 12 hours daily.

Males and females mate for life but will find a new mate if their mate is lost or dies. Most snow geese choose mates having the same color as the family in which they themselves were reared. Individuals pair up during their second winter or on their second northward migration, when they are almost two years old. Generally they first breed successfully at age three. During courtship, the male puffs up his body and stands in an exaggeratedly straight and tall posture. Males and females display to each other by raising the head and neck, calling vociferously, and flapping their wings. Mating takes place in shallow water and on land.

Snow geese nest on arctic tundra near river mouths and on islands in lakes and rivers, usually within five miles of the coast. They gather in colonies that vary greatly in the numbers and densities of pairs. A pair defends an area around their nest, where both partners feed heavily. The female builds a

shallow nest out of plant material and down plucked from her body; she may reuse her last year's nest. Nests are often sited on low ridges or hummocks offering good visibility over the surrounding terrain. A female typically lays three to five creamy white eggs, sometimes as many as seven. Incubation is by the female alone, with the male remaining close to the nest. Sometimes one pair may trespass in another pair's territory; while the resident male is occupied in driving off the intruding male, the intruding female tries to lay an egg in or near the resident female's nest. Because unattended eggs attract predators, a female will usually roll a deserted egg into her own nest, which can lead to her rearing another female's young. Biologists describe this phenomenon as "nest parasitism."

Key nest predators are arctic and red foxes, herring and glaucous gulls, and parasitic jaegers. Polar bears, black bears, gray wolves, and ravens also take some eggs. Snow goose eggs hatch after 22 to 23 days of incubation. The goslings emerge wet, but they dry out within four hours beneath the brooding female. Goslings are able to walk, swim, dive, and feed as soon as they leave the nest, usually within a few hours of hatching.



Both parents help raise the young. In shifting about between food sources, a family may walk more than 2 miles per day and up to 45 miles during the course of the brood-rearing season. Goslings graze on vegetation, and they also eat some insects. They grow rapidly, gaining around 5.5 ounces per day. Goslings are taken by gulls, foxes, and snowy owls; adults are occasionally preyed on by foxes, wolves, bears, and bald and golden eagles.

The young begin to fly 42 to 50 days after hatching. They stay with their parents while migrating south for their first winter. The family remains intact through the winter and during the migratory journey north again in spring. After arriving on the breeding grounds, the family breaks up and the adults begin rearing another brood.

During migration, snow geese fly both by day and night often traveling in large flocks. Usually they migrate along fairly narrow corridors, with traditional stopping points along the way. Migrating snow geese take advantage of following winds, good visibility, and periods of no precipitation. They fly in long, diagonal lines and in V-formations, at altitudes of up to 7,500 feet. When preparing to land, they may tumble to lose height in what has been described as a "maple-leaf" maneuver.

The species' breeding range extends from Russia east to western Greenland. Population delineation across the range is continually being refined as new research and monitoring data is accumulated and management actions are developed through the cooperative flyway council process. The western population breeds in Russia, Alaska and Canada's Yukon, Northwest, and Nunavut territories and winters from Oregon south to Mexico, with concentrations in the Central Valley of California. The midcontinent population breeds from Nunavut Territory east to Hudson Bay and winters in the U.S. Midwest south to Louisiana and Texas, with concentrations in Arkansas, Kansas, Louisiana, Missouri, and Texas. The eastern population breeds on islands in the High Arctic, including Ellesmere and Baffin. The eastern population winters along the Atlantic Coast from Massachusetts to North Carolina, with concentrations in southeastern Pennsylvania, New Jersey, Delaware, Maryland, Virginia, and North Carolina. In winter, snow geese are highly gregarious and often feed in flocks numbering thousands of individuals.

Migrants follow all four major North American flyways. Migration north from wintering areas takes place from February to May. In autumn, snow geese depart from the northern breeding areas in September and arrive in wintering habitats in November and December. In Pennsylvania, snow geese are seen more frequently in spring than in fall. They pass through the state from mid-February to late March, with a peak in late February or early March; an excellent place to view migrating snow geese is the Game Commission's Middle Creek Wildlife Management Area in Lancaster County. Peak numbers have been recorded as high as 200,000 birds. In autumn, the greatest numbers of snow geese pass through Pennsylvania in November. Each year, weather conditions and food availability influence migration dates.

Snow geese can live more than 26 years. Individuals perish from avian cholera, hitting power lines in flight, hunting and predation. Potential predators on the wintering range include coyotes, foxes, and eagles.

Habitat

In summer, snow geese nest along braided river mouths, on lake and river islands and in sections of arctic tundra studded with ponds. Many of the greater snow geese that winter in Pennsylvania nest in the eastern high arctic with Baffin and Bylot islands containing the largest colonies. They favor areas that become clear of snow early in the year and do not flood during the spring thaw. Parents lead their goslings to food-rich areas including damp meadows, edges of freshwater lakes and ponds, and tidal marshes. During spring and fall migrations, snow geese frequent freshwater and brackish marshes, slow-moving rivers, lakes, ponds and farm fields. Winter habitats include coastal marshes, wet grasslands and agricultural fields. Pennsylvania is attractive to snow geese because of the large number of agricultural fields. Waste grains left after harvesting allow birds to recharge fat reserves needed for spring migration and nesting and thus has been implicated in increasing survival rates of snow geese. At times, snow geese can be destructive feeders, pulling stems and roots of plants out of the ground. This grubbing behavior is largely responsible for extensive habitat damage of marsh habitats on both breeding and wintering areas.

Population

Around 1900, the population of snow geese had ebbed to only 2,000 to 3,000 birds. During the twentieth century and into the twenty-first century, the population has burgeoned as snow geese have begun taking advantage of farm crops, including waste grain, along migration routes and in wintering areas. In some areas, populations have increased as much as 9 percent per year. Biologists estimate that there are now 10 to 20 million snow geese in North America, a population that may be too large to be environmentally sustainable.

Each year, wintering populations vary in abundance, depending on nesting conditions in the arctic (cold, wet weather may drastically lower breeding success); the availability of food on breeding grounds, staging areas, and stopover points along migration corridors; and hunting pressure. Harvest estimates since 1998 indicate that from 1 million to 1.5 million birds are harvested annually. Recent conservation hunts implemented in Canada and the US have been successful in doubling the harvest rates of snow geese and bringing down the populations of both lesser and greater snow geese. When snow geese populations are too large, the birds' feeding can destroy their own habitat, which is also used by other species.