

GREAT GRAY OWL - STRIX NEBULOSA

Distinguished from Barred Owl (*Strix varia*) by large size, bright yellow eyes, unbarred breast, conspicuous white throat markings, and more definite concentric rings on facial disc.

Taxonomy: Kingdom: Animalia Phylum: Chordata Class: Aves Order: Strigiformes Family: Strigidae Genus: *Strix* Species: *S. nebulosa*

Habitat:

Biomes: In Canada, Great Grays spend the year in dense, wet evergreen forests of the far north, also known as taiga, where they hunt in meadows, bogs, or other open areas with a few scattered trees. In the United States, they use pine and fir forests adjacent to montane meadows between 2,500 and 7,500 feet. In California and Oregon during the winter months, owls often move downslope into oak woodlands and lower elevation mixed deciduous and evergreen forests.

Distribution:

In US: They breed in North America from as far east as Quebec to the Pacific coast and Alaska, and from Finland and Estonia across northern Asia. They are permanent residents, although northerly populations may move south and southeast when food is scarce. In Europe they are found breeding in Norway and Sweden and more numerous through Finland and Russia. Even though the species occurs in Europe, the first great grey owl recognized by science was found in Canada in the late 18th century.

In Other Countries: ^^^^^

Holistic Description: The Great Gray Owl is a dapper owl dressed in a gray suit with a bow tie across its neck and a surprised look on its face. In the stillness of a cold mountain meadow the elusive giant quietly floats on broad wings across meadows and openings in evergreen forests. They are mostly owls of the boreal forest with small populations in western mountains, but in some years they move farther south in search of food, giving some a unique opportunity to see this majestic owl.

Species Richness: 2 SUBSPECIES

Population Dynamic: CHECK THREATS

Evolution and Systematics:

Evolution: *Strix nebulosa* is not represented in the fossil record of North America. There are, however, other closely related fossils from the Tertiary period. 18.0–19.0 mybp.

Systematics: Two subspecies: *S. n. nebulosa* in North America; *S. n. lapponica* in Europe and Asia. North American *nebulosa* darker than Eurasian *lapponica*; gray streaks on upperparts less distinctly defined and pale sides of feathers more extensively barred gray.

Number of Species: 2 SUBSPECIES

Number of Genera: 2 SUBSPECIES

Physical Characteristics:

Size and Length: Length: 24.0-33.1 in (61-84 cm) Weight: 24.7-60.0 oz (700-1700 g)

Wingspan: 53.9-60.2 in (137-153 cm)

Coloration: Great Gray Owls are silvery gray overall—patterned with fine white, gray, and brown streaking and faint barring. Their yellow eyes shine through the fine gray-and-brown concentric circles of the facial disk. Two pale arcs form an “X” between the eyes. Across the neck sits a white “bow tie” marking with a black center. Their bill, if visible, is yellow. Males and females look similar.

General Body Features: Great Grays are one of our tallest owls, and have broad wings and a long tail. They are big headed owls with a large facial disk. They dwarf most other owls in size but not by weight; their bulk is mostly made of feathers. Females are larger than males.

Special Features of the Body: The Great Grey Owl has a unique facial disk to help channel sound to its ears. It also is equipped with fluffy, dense feathers that make its flight silent and help to insulate it from the cold. The colors of an owl's feathers help it blend in with the natural environment and, of course, keep it warm.

Special Features of the Head and Sensory Organs: Owls use tufts to help camouflage, or disguise, themselves. When the tufts are raised, they resemble small twigs or branches. They help the owls stay hidden from predators. Owls hide from songbirds, too, because the little birds dive and make a racket when they spot an owl, a behavior called mobbing. The commotion warns other songbirds that an owl is in the area. An owl would have to turn its whole head to the right and then to left to take in normal human field of vision. Not a problem, however. Owls have 14 neck bones – double the number humans have. These neck bones, along with a special bone at the base of the skull, allow movement. An owl can turn its head 270 degrees in both

directions – that is more than halfway around its body, but not quite a full turn around. This gives owls the ability to swivel their head around to see who might be sneaking up from behind.

Dentition: BEAK/LAMELLAE/GIZZARD

Special Features of the Limbs and Digits: Owls fly skillfully without much effort, because their wings are large compared with the size and weight of their bodies. With large wings and a light body, owls can carry heavy prey animals, fly among thick vegetation and trees, and hover above open fields. SILENT FLIGHT. ZYGODACTYL. At the end of each toe is a long, sharp claw called a talon. The owl uses its talons to snatch, squeeze, and kill prey animals. It also uses talons to defend itself against predators, such as hawks, other owls, badgers, and raccoons.

Any Special Internal Anatomy: NONE

Sexual Dimorphisms: Male smaller than female; appears less bulky when pair seen together.

Differences Between Juvenile Stage and Adult: Barred on underparts and olive-brown, darkly barred and white spotted on upperparts. Facial markings: disk pale gray with broad black contrasting concentric rings.

Behavior:

Diurnal, Nocturnal, or Crepuscular: Nocturnal

Activity: Great Gray Owls are active at night and at dusk and dawn. They also hunt during the day, especially when they have nestlings or during the winter months. They forage in meadows where voles and other small mammals are abundant. In northern Europe, the Rocky Mountains, and the central Cascades of Oregon they also forage in clearcuts that have a few remaining trees for perching. They glide low over these open areas with slow and quiet wingbeats listening and looking for small mammals. They have excellent hearing and can find prey by hearing alone—even under a thick cover of snow—thanks to asymmetrical ear openings that help them triangulate sound with great precision. Males and females form pairs during the breeding season, but they don't stay together during the nonbreeding season. Males and females defend their nest sites from other owls and raptors. The first line of defense is a threatening display. They spread their facial feathers to expose their bill, which they fiercely snap, drop their wings, or hoot to shun the intruder. If that doesn't work, they may escalate territory defense to chasing and sometimes attacking the intruder. Most owls are year-round residents, but sometimes they move farther south in search of food. Populations in California and Oregon, in most winters, move to lower elevations areas with reduced snowpack.

Locomotion: Rarely walks on ground; on hard snow, walks and even runs easily. Young climb well with aid of feet, wings, and bill. Flightless young frequently hop on ground between trees. Wing beats slow and deep, moth-like. Flight surprisingly agile and fast at times. Often hovers above suspected prey location prior to sudden pounce. LOW WING LOADING.

Communication and Perception: During the breeding season (roughly from March–July), males and females give a low-pitched series of resonating hoos that last for 6–8 seconds with about 30 seconds between calls. The male's vocalization is lower pitched than the female's.

Home Range: Paired male and female occasionally roost in contact in spring, especially prior to egg laying; otherwise occupy solitary roosts. Needs study, especially in relation to prey abundance. Species seems to be territorial (intraspecific) only in immediate vicinity of the nest; generally does not defend foraging areas. Adult male establishes territory by vocalizing in the vicinity of the nest site. Territories can be established as early as the autumn prior to nesting. Given adequate prey, adult males in Manitoba and Minnesota may maintain a territory around the nest site all year.

Degree of Sociality: In Manitoba and Minnesota, mostly solitary in autumn and early winter, becoming increasingly gregarious towards March. Groups of up to 15 individuals observed in late winter.

Level of Aggression: Immediate vicinity of nest site actively defended against other Great Gray Owls and some other species including Common Raven, Broad-winged Hawk, Northern Goshawk, and Great Horned Owl. Intruders chased, occasionally attacked with talons. Attack may or may not be preceded by threat display. Females particularly savage in defending small nestlings.

Migration: Resident (nonmigratory). In some areas and in some years, Great Gray Owls irrupt, or move out of their normal range, traveling farther south or to lower elevations in search of food.

Predators:

Predators: Northern Goshawks, Great Horned Owls, Red-tailed Hawks, Black Bear, Fisher, and Lynx.

Anti-Predator Defenses: NONE DESCRIBED. USE OTHER OWLS.

Diet and Nutrition:

Adult Diet: Small mammals such as voles, pocket gophers, mice, moles, chipmunks, and lemmings make up the majority of their diet. They hunt at night and during the day from perches where they listen intently for small mammals moving under the snow. Once they detect a small mammal they hover above the snow, and plunge talons first into the snow to grab it.

Juvenile Diet: ^^^^^

Special Adaptations for Getting Prey: Hunts primarily from perches, listening and watching the ground intently; stoops short distances. Asymmetrical ear openings undoubtedly help this owl detect prey by sound alone. Individuals typically hover above the snow, then plunge face downward and break through the snow cover with clenched feet, attempting to grasp prey with their feet and talons; reported breaking through snow crust hard enough to support an 80 kg man. Small mammals are normally swallowed whole; larger prey consumed by picking meat off the carcass. Feet and claws are relatively small, with the claws less formidable than in other large owls, but nevertheless thin and needle-sharp, with a wide reach.

Reproduction:

Mode of Reproduction: Monogamous

Mating System: Monogamous. Occasional polygyny suspected.

Mating Season: March to July

Courtship: Limited information available. Nero describes exaggerated pseudo-hunting and snow-plunging by adult males as early courtship behavior. Adult females apparently employ a similar display when establishing winter feeding territories. Courtship feeding and mutual preening are extensive and help establish and maintain pair bonds.

Territoriality: HOME RANGE and may compete with Great Horned Owls for nest sites; both species favor the open, abandoned nests of other large raptors.

Mating: Nero observed copulation in late afternoon on 27 March 1971; one or both birds gave a “rasping screech.” Pre-copulation, male pursues female, often in flight, usually copulating immediately after female lands.

Nesting: Small mammals such as voles, pocket gophers, mice, moles, chipmunks, and lemmings make up the majority of their diet. They hunt at night and during the day from perches where they listen intently for small mammals moving under the snow. Once they detect a small mammal they hover above the snow, and plunge talons first into the snow to grab it. Great Gray Owls don’t build nests. Instead they use old raptor or Common Raven nests, or even nests built by western gray squirrels, and do not add any additional material to the nest. They also place their eggs in the broken tops of dead trees, human-made platforms, or in clumps of mistletoe. If they nest in a broken-topped tree, the female may scratch a depression to lay the eggs, but she does not build a nest. The location where they lay their eggs varies depending on the nest site they chose to use.

Egg-Laying: Clutch Size: 2-5 eggs Egg Length: 2.1-2.1 in (5.3-5.4 cm) Egg Width: 1.6-1.7 in (4.2-4.3 cm) Incubation Period: 28-36 days Nestling Period: 26-29 days Egg Description: Dull white and unmarked

Hatching and Incubation/Gestation: Helpless, eyes closed, completely covered in fluffy down.

Development: Nidicolous and semi-precocial. Weights of four newly hatched young: 36–39 g; covered with down.

Parental Care: Brooding by female only; begins immediately after hatching and lasts 2–3 wk, at which point the female starts roosting near the nest. Male brings prey to the female and female feeds young. After fledging, young usually fed directly by male.

Lifespan: Around 13 years, up to 18 years.

Conservation:

Official Federal Status: Least Concern

Special Statuses in Individual States: NONE

Threats: The Great Gray Owl’s far northern range and elusive habits make it difficult to monitor population trends with surveys like the North American Breeding Bird Survey. Partners in Flight estimates the global breeding population at 190,000, with 7% living in the U.S. and 43% in Canada (with the remainder occurring in Eurasia). The State of North America’s Birds 2016 report rates the species an 11 out of 20 on the Continental Concern Score and it is not on the 2016 State of North America’s Birds Watch List. In the United States, Great Gray Owls are at the southern limits of their range and are uncommon, but they are fairly common throughout their Holarctic range.

Conservation Efforts: ^^^^^^^

Extra Facts:

1. Although the Great Gray Owl is one of the tallest owls in the U.S., it’s just a ball of feathers. Both the Great Horned Owl and Snowy Owl weigh more than a Great Gray Owl and they have larger feet and talons.
2. Great Gray Owls aren’t just North American owls. They also live in Scandinavia, Russia, Siberia, and Mongolia.
3. Great Gray Owls are powerful birds. Despite weighing only 2.5 pounds, they can break through hard packed snow to grab a small mammal. One bird reportedly broke through snow that was hard enough to support a 176-pound human.
4. Great Gray Owls are big owls, which means that they need to eat regularly. In the winter, they eat up to 7 vole-sized small mammals every day.

5. Both the common and scientific names are apt for this large gray owl. The Latin name for Great Gray Owl is *Strix nebulosa*. *Strix* means to utter shrill sounds and *nebulosa* means misty or cloudy, referring to its gray color.
6. Imagine what it would be like if you could hear even the slightest noise and knew exactly where the noise was coming from. Well, that is exactly what Great Gray Owls can do. Like the Barn Owl and Long-eared Owl they have asymmetrical ear openings that help them find prey by sound alone. The left ear opening is higher on the head than the right ear opening which enables precise directional hearing and lets them nab invisible prey.
7. The oldest recorded Great Gray Owl was at least 18 years, 9 months old and lived in Alberta, where it was banded in 1996 and found in 2013, after being hit by a car.
8. In some areas it is also called Phantom of the North, cinereous owl, spectral owl, Lapland owl, spruce owl, bearded owl, and sooty owl.

Notable Species:

1. *S. n. nebulosa* (Forster, 1772): North America from central Alaska eastward across Canada to south-western Quebec, and south to northern California, northern Idaho, western Montana, Wyoming and north-eastern Minnesota.
2. *S. n. lapponica* (Thunberg, 1798): Northern Eurasia, from Fennoscandia through Siberia to Sakhalin and Kamchatka Krai to Lithuania, Lake Baikal, Kazakhstan, Mongolia, Manchuria and north-eastern China.