

# GREAT HORNED OWL - BUBO VIRGINIANUS

This species' "horns" are tufts of feathers, called plumicorns. The purpose of plumicorns is not fully understood, but the theory that they serve as a visual cue in territorial and sociosexual interactions with other owls is generally accepted.

**Taxonomy:** Kingdom: Animalia Phylum: Chordata Class: Aves Order: Strigiformes Family: Strigidae Genus: Bubo Species: B. virginianus

## **Habitat:**

**Biomes:** Found all across North America up to the northern tree line, Great Horned Owls usually gravitate toward secondary-growth woodlands, swamps, orchards, and agricultural areas, but they are found in a wide variety of deciduous, coniferous or mixed forests. In some areas, such as the southern Appalachians, they prefer old-growth stands. Their home range usually includes some open habitat—such as fields, wetlands, pastures, or croplands—as well as forest. In deserts, they may use cliffs or juniper for nesting. Great Horned Owls are also fairly common in wooded parks, suburban area, and even cities.

## **Distribution:**

**In US:** The breeding habitat of the great horned owl extends high into the subarctic of North America, where they are found up to the northwestern and southern Mackenzie Mountains, Keewatin, Ontario, northern Manitoba, Fort Chimo in Ungava, Okak, Newfoundland and Labrador, Anticosti Island and Prince Edward Island. They are distributed throughout most of North and very spottily in Central America and then down into South America south to upland regions of Argentina, Bolivia and Peru.

**In Other Countries:** NONE

**Holistic Description:** With its long, earlike tufts, intimidating yellow-eyed stare, and deep hooting voice, the Great Horned Owl is the quintessential owl of storybooks. This powerful predator can take down birds and mammals even larger than itself, but it also dines on daintier fare such as tiny scorpions, mice, and frogs. It's one of the most common owls in North America, equally at home in deserts, wetlands, forests, grasslands, backyards, cities, and almost any other semi-open habitat between the Arctic and the tropics.

**Species Richness:** 15 SUBSPECIES

**Population Dynamic:** The great horned owl is not considered a globally threatened species by the IUCN. Including the Magellanic species, there are approximately 5.3 million wild horned owls in the Americas. Most mortality in modern times is human-related, caused by owls flying into man-made objects, including buildings, cars, power lines, or barbed wire. In one study, the leading cause of death for owls was collision with cars, entanglement with wires, flying into buildings and, lastly, electrocution.

## **Evolution and Systematics:**

**Evolution:** Pleistocene fossil localities in which Great Horned Owl bones have been found are almost all from western, intermountain, and midwest regions, with a single exception.

**Systematics:** Color variation is correlated with prevailing regional humidity: the darkest populations occur in the Pacific Northwest (north to s. Alaska) and Atlantic Canada, intermediate populations occur in mesic environments of eastern deciduous forests and n. Rocky Mts., moderately pale populations occur in the s. Rocky Mts. and along the Pacific coast of California and Oregon, and pale populations occur in the arid Southwest and in xeric western and subarctic prairies.

**Number of Species:** 15 SUBSPECIES

**Number of Genera:** 15 SUBSPECIES

## **Physical Characteristics:**

**Size and Length:** Length: 18.1-24.8 in (46-63 cm) Weight: 32.1-88.2 oz (910-2500 g)

**Wingspan:** 39.8-57.1 in (101-145 cm)

**Coloration:** Great Horned Owls are mottled gray-brown, with reddish brown faces and a neat white patch on the throat. Their overall color tone varies regionally from sooty to pale.

**General Body Features:** These are large, thick-bodied owls with two prominent feathered tufts on the head. The wings are broad and rounded. In flight, the rounded head and short bill combine to create a blunt-headed silhouette.

**Special Features of the Body:** Owls are adapted to be nocturnal predators, with silent flight resulting from soft feathers and serrated wing edges. Hearing is excellent, with asymmetrical ears that facilitate pinpointing the site of prey. Their facial curves are specially adapted to focusing sound for the identification of prey, even in pitch darkness.

*Special Features of the Head and Sensory Organs:* Eyes are visually highly adapted for nocturnal hunting and provide a wide, almost completely binocular field of view, a large corneal surface and a predominantly rod retina. Instead of turning its eyes, an owl must turn its whole head, and the great horned owl is capable rotating its neck 270°. Black and White instead of color.

*Dentition:* BEAK/LAMELLAE/GIZZARD

*Special Features of the Limbs and Digits:* The wing loading, the measured wing area compared to weight, is high, meaning the wings are relatively small in surface area for the bird's weight; the species' wing loading has been described as proportionately the highest among raptors. Great horned owls can apply at least 300 lb/in<sup>2</sup> of crushing power in their talons, a pressure considerably greater than the human hand is capable of exerting. In some big females, the gripping power of the great horned owl may be comparable to much larger raptor species such as the golden eagle.

*Any Special Internal Anatomy:* NONE

*Sexual Dimorphisms:* Female heavier than male, with males having longer tails than females.

*Differences Between Juvenile Stage and Adult:* Note some retained down feathers in this recently fledged individual. Juvenile contour feathers soft and loose, somewhat similar to down in texture; feathers of rump, thigh, and undertail particularly long and fluffy. Compared to second down, Juvenile body feathers somewhat darker buff, especially on breast, with dusky barring, heavier on back than on breast.

### **Behavior:**

*Diurnal, Nocturnal, or Crepuscular:* Nocturnal

*Activity:* Great Horned Owls roost in trees, snags, thick brush, cavities, ledges, and human-made structures. They are active mostly during the night—especially at dusk and before dawn. When food supplies are low they may begin hunting in the evening and continue into the early morning; in winter they may hunt during daylight hours. Mated pairs are monogamous and defend their territories with vigorous hooting, especially in the winter before egg-laying and in the fall when their young leave the area. Great Horned Owls respond to intruders and other threats with bill-clapping, hisses, screams, and guttural noises, eventually spreading their wings and striking with their feet if the threat escalates. They may kill other members of their own species. Crows, ravens, songbirds, and raptors often harass Great Horned Owls with loud, incessant calls and by dive-bombing, chasing, and even pecking them. Unattended eggs and nestlings may fall prey to foxes, coyotes, raccoons, lynx, raptors, crows, and ravens. Both members of a pair may stay within the territory outside of the breeding season, but they roost separately.

*Locomotion:* May alight and walk on the ground to pursue small prey hidden in brush; also walks along ledges, along branches, and around nests. Generally a poor walker on the ground; walks like a European Starling. Aspect ratio of wings is near the mean for 15 owl species, but wing-loading is high; wings are relatively short and broad, good for low speed and maneuverability.

*Communication and Perception:* Great Horned Owls advertise their territories with deep, soft hoots with a stuttering rhythm: hoo-h' HOO-hoo-hoo. The male and female of a breeding pair may perform a duet of alternating calls, with the female's voice recognizably higher in pitch than the male's.

*Home Range:* Highly territorial. Mated pairs occupy territories year-round and long-term. Territories are established and maintained through hooting, with highest activity before egg-laying and second peak in autumn when juveniles disperse.

*Degree of Sociality:* Solitary except during the nesting season. Although members of a pair may remain within the same territory throughout the year, usually they roost close together only before egg-laying, sometimes 4 - 5 wk before egg-laying, and males roost close to the nest only until young fledge.

*Level of Aggression:* May kill other individuals of its own species; 4 adult owls at Kluane, Yukon Territory, were most likely killed and eaten by other Great Horned Owls, with convincing evidence for 2 of these instances.

*Migration:* No annual migration; most individuals are permanent residents. IRRUPTIONS HAVE BEEN DOCUMENTED.

### **Predators:**

*Predators:* Red Fox, Coyotes, Lynx, Opossums, Wolverines, Bobcats, Black Racer, Red-shouldered Hawk, California Newt.

*Anti-Predator Defenses:* In Saskatchewan, banders climbing to nest are occasionally struck by talons of the attacking adult. When banders climbed nest trees in the Yukon Territory, males were 4 times less likely to attack a human intruder than females were.

### **Diet and Nutrition:**

*Adult Diet:* Great Horned Owls have the most diverse diet of all North American raptors. Their prey range in size from tiny rodents and scorpions to hares, skunks, geese, and raptors. They eat mostly mammals and birds—especially rabbits, hares, mice, and American Coots, but also many other species including voles, moles, shrews, rats, gophers, chipmunks, squirrels, woodchucks, marmots, prairie dogs, bats, skunks, house cats, porcupines, ducks, loons, mergansers, grebes, rails, owls, hawks, crows, ravens, doves, and starlings. They supplement their diet with reptiles, insects, fish, invertebrates, and

sometimes carrion. Although they are usually nocturnal hunters, Great Horned Owls sometimes hunt in broad daylight. After spotting their prey from a perch, they pursue it on the wing over woodland edges, meadows, wetlands, open water, or other habitats. They may walk along the ground to stalk small prey around bushes or other obstacles.

Juvenile Diet: ^^^^^

Special Adaptations for Getting Prey: Sights most prey from perch, but hunts mammals and birds over woodland edges, meadows, open and semi-open grasslands, and sagebrush. Captures prey with talons, which are so strong they require a force of 13 kg to be opened. Swallows small prey whole. Dismembers larger prey before swallowing. Usually crushes skull or decapitates prey; may also crush some other bones before swallowing. Swallows small mammals, birds, and invertebrates whole, generally headfirst. Headless prey offer strong evidence for owl predation.

### **Reproduction:**

Mode of Reproduction: Monogamous

Mating System: Apparently monogamous. No polygamy detected, despite intensive effort, even at peak of prey cycles.

Mating Season: Usually around March - August

Courtship: Male approaches female with much bowing and hooting. Male cocks his tail, swells his white bib, and with much bobbing and jerking utters a series of deep sonorous calls that elicit calling responses by the female, followed by a cautious approach to the female, continuing much tail-bobbing and posturing. The 2 engage in bouts of calling and bowing with wings drooped or cocked at angles to body. In both sexes, courtship calls are accompanied by expansion of the white bib of neck-feathers and tail-bobbing in synchrony; especially pronounced in males. Movements and fluffed white bib may enhance visual stimulus between members of courting pair during low-light conditions in which courtship occurs.

Territoriality: HOME RANGE and most territorial defense performed by male, but female frequently assists her partner in hooting contests with neighbors or intruders, even during incubation.

Mating: During copulation, the female's posture was horizontal, wings folded and held slightly away from the body, back arched downward, and tail raised to accept the male. Male stretched his wings and flapped about 4 times/s to keep balance. His head was down, back arched downward, and tail up. As he treaded, his beak nuzzled feathers of the female's nape. Both owls hooted at a rate of 4 or 5 hoots/s throughout copulation, which lasted 4–7 s.

Nesting: Great Horned Owls typically nest in trees such as cottonwood, juniper, beech, pine, and others. They usually adopt a nest that was built by another species, but they also use cavities in live trees, dead snags, deserted buildings, cliff ledges, and human-made platforms. In the Yukon they nest in white spruces with “witches’ brooms,” which are clumps of dense foliage caused by a fungus. They occasionally nest on the ground. Pairs may roost together near the future nest site for several months before laying eggs. Nests often consist of sticks and vary widely in size, depending on which species originally built the nest (usually Red-tailed Hawks, other hawk species, crows, ravens, herons, or squirrels). Great Horned Owls may line the nest with shreds of bark, leaves, downy feathers plucked from their own breast, fur or feathers from prey, or trampled pellets. In some areas they add no lining at all. Nests deteriorate over the course of the breeding season, and are seldom reused in later years.

Egg-Laying: Clutch Size: 1-4 eggs Number of Broods: 1 brood Egg Length: 2.1-2.2 in (5.3-5.6 cm) Egg Width: 1.8-1.9 in (4.5-4.7 cm) Incubation Period: 30-37 days Nestling Period: 42 days Egg Description: Dull white and nearly spherical, with a rough surface.

Hatching and Incubation/Gestation: Helpless, with closed eyes, pink skin, and white down on upperparts.

Development: Altricial; naked; eyes closed; almost immobile in nest. Mass 49-54 g. Down white on upperparts; pink apteria and feet. Young show remnants of yolk sac and retain egg tooth for 4-6 d.

Parental Care: All brooding by female; close and almost continuous until young are about 2 wk old, depending on ambient temperature, then gradually decreases. Female tears food into small pieces and feeds young, bill to bill. Male brings all food to nest at least until female terminates brooding.

Lifespan: Among all owls, they may outrank even the larger Eurasian eagle owl in known longevity records from the wild, with almost 29 years being the highest age for an owl recorded in North America. A more typical top lifespan of a great horned owl is approximately 13 years.

### **Conservation:**

Official Federal Status: Least Concern

Special Statutes in Individual States: NONE

Threats: Great Horned Owls are common and widespread throughout much of the Americas, however populations declined throughout their range by about 33% between 1966 and 2015, according to the North American Breeding Bird Survey. Canadian populations had even greater declines - over 2.5% per year during those years - resulting in a cumulative loss of 72%. Partners in Flight estimates the global breeding population at 6 million with about 45% of in the U.S., 14% in Canada,

and 7% in Mexico. The species rates an 8 out of 20 on the Continental Concern Score and is not on the 2016 State of the Birds Watch List. Great Horned Owls were heavily hunted until the practice was abolished in the mid-twentieth century. Some illegal hunting continues. Northern populations rise and fall in cycles along with prey populations. The species adapts well to habitat change as long as nest sites are available. In the Pacific Northwest they have expanded into open land recently created by logging. Because of their prowess as predators, Great Horned Owls can pose a threat to other species of concern, such as Peregrine Falcons and Spotted Owls. Owls are sometimes poisoned by pesticides and other toxic substances that have accumulated in their prey.

Conservation Efforts: ^^^^^

**Extra Facts:**

1. Great Horned Owls are fierce predators that can take large prey, including raptors such as Ospreys, Peregrine Falcons, Prairie Falcons, and other owls. They also eat much smaller items such as rodents, frogs, and scorpions.
2. When clenched, a Great Horned Owl's strong talons require a force of 28 pounds to open. The owls use this deadly grip to sever the spine of large prey.
3. If you hear an agitated group of cawing American Crows, they may be mobbing a Great Horned Owl. Crows may gather from near and far and harass the owl for hours. The crows have good reason, because the Great Horned Owl is their most dangerous predator.
4. Even though the female Great Horned Owl is larger than her mate, the male has a larger voice box and a deeper voice. Pairs often call together, with audible differences in pitch.
5. Great Horned Owls are covered in extremely soft feathers that insulate them against the cold winter weather and help them fly very quietly in pursuit of prey. Their short, wide wings allow them to maneuver among the trees of the forest.
6. Great Horned Owls have large eyes, pupils that open widely in the dark, and retinas containing many rod cells for excellent night vision. Their eyes don't move in their sockets, but they can swivel their heads more than 180 degrees to look in any direction. They also have sensitive hearing, thanks in part to facial disc feathers that direct sound waves to their ears.
7. The oldest Great Horned Owl on record was at least 28 years old when it was found in Ohio in 2005.

**Notable Species:**

1. B. v. *Saturatus* - Resident along the humid Pacific coast from s. Alaska to nw. California.
2. B. v. *Pacificus* - Resident in California west of the Sierra Nevada except in the San Joaquin Valley and coastal n. California, south to nw. Baja California.
3. B. v. *Elachistus* - Resident in Baja California.
4. B. v. *Lagophonus* - Breeds in the n. Rocky Mtn. from w.-central Alaska south through British Columbia to ne. Oregon, central Idaho, and nw. Montana; reported in winter south and east as far as Colorado and Texas.
5. B. v. *Subarcticus* - Breeds in Mackenzie and ne. British Columbia east to Hudson Bay.
6. B. v. *Pinorum* - Breeds in the Great Basin and Rocky Mts. from ne. California and s. Idaho south to ne. Arizona.
7. B. v. *Pallesens* - Resident of central California.
8. B. v. *Heterocnemis* - Breeds in n. Quebec, Labrador, and Newfoundland.
9. B. v. *Virginianus* - Largely resident from Minnesota east to Nova Scotia and Prince Edward I. and south through e. Kansas.
10. B. v. *Mayensis* - Resident on the Yucatan Peninsula.
11. B. v. *Mesembrinus* - Resident in Middle America from the Isthmus of Tehuantepec, s. Mexico, to w. Panama.
12. B. v. *Nigrescens* - Resident in arid temperate and puna zones of the Andes from Colombia south to nw. Peru.
13. B. v. *Nacurutu* - Resident spottily in lowlands from e. Colombia east to Guyana and south to e. Bolivia southeast to n. Argentina.
14. B. v. *Deserti* - Resident in arid ne. Brazil.
15. B. v. *Magellanicus* - Resident in highlands from central Peru south to Tierra del Fuego.