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# Barn Owl

*Tyto alba*

## General Description

The Barn Owl is nearly cosmopolitan and is considered the most widely distributed land bird in the world. It prefers dry areas and has a low tolerance for cold climates such as those characteristic of northern Canada, Scandinavia, Russia, Antarctica, Siberia, and high altitude countries. Surprisingly it is absent from New Zealand as well.

It is a medium-sized, nocturnal owl of open country including fields, farmlands, and grasslands. It has a large head without ear tufts and a heart-shaped, triangular, or sometimes rounded facial disk. The eyes are blackish. The unusually long bill is yellow-ivory colored. Its legs are long and skinny, nearly three inches in length, and feathered. Sexes are similar, but in some areas of North America females may be slightly darker and more spotted than males. Plumage, however, is very variable.

It sits erect and appears to have rather long wings in flight.

## Size

The Barn Owl is a medium-sized owl that ranks sixth in over-all size. Females are larger and heavier than males. The total length of females ranges between 13.4 and 15.7 inches (34 to 40 centimeters) and males 12.6 and 15.0 inches (32 to 38 centimeters). Females weigh about 20 ounces (570 grams) while males average 16.5 ounces (470 grams). It has the fourth largest wingspan among North American owls; females average about 43 inches (110 centimeters) while males are slightly smaller at 42 inches (107 centimeters).

## Morphs

There are two color morphs, an orange and white phase, with many gradations between these. The white phase is more widespread, while the orange phase occurs in populations locally.

## Specific Description

### Adult (white phase)

- refer to above
- upperparts golden-brown
- underparts white speckled with dark flecks
- face white or light

### Adult (orange phase)

- refer to above
- very little white in plumage
- upperparts orange-ochraceous
- underparts light to dark ochraceous buff
- face "dirty" as though tinged with buff-brown

### Juvenile (white and orange phase)

- similar to adult but with traces of white fluffy down on body

## Similar Species

The Barn Owl is likely to be confused only with other light colored owls, including the Snowy Owl, which is larger and has an indistinct rounded facial disk and yellow eyes, and the juvenile Great Horned Owl, which is all gray-white.

#### Other Names

It is also known as the Monkey-faced Owl, Citrus Owl, Golden Owl, Church Owl, Rat Owl, Steeple Owl, Stone Owl, White Owl, Orange Owl, American Barn Owl, and Queen-of-the-Night.

#### Etymology

The scientific name *Tyto alba* translates into "a species of white owl."

#### Mythology

Folk-lore surrounding the Barn Owl is better recorded than for most other owls. The species has been associated with wisdom, death, witchcraft, doom, evil, superstitions, and joy.

During the eighteenth and nineteenth centuries, the poets Robert Blair and William Wordsworth used the Barn Owl as their favorite "bird of doom." During that same period many people believed that the screech or call of an owl flying past the window of a sick person meant imminent death. The Barn Owl has also been used to predict the weather by people in England. A screeching owl meant cold weather or a storm was coming. If heard during foul weather a change in the weather was at hand.

In early Rome a dead owl nailed to the door of a house averted all evil that it supposedly had earlier caused. The death of Julius Caesar was apparently predicted by an owl. In English literature the Barn Owl had a sinister reputation probably because it was a bird of darkness, and darkness was always associated with death.

#### RANGE

North America - Resident throughout its range on the continent from southwestern British Columbia (including southeastern Vancouver Island), western Washington, northern Utah, southern Wyoming, Nebraska, Iowa, southern Wisconsin, southern Michigan, southern Ontario, New York, southern Vermont, and Massachusetts south through the United States. A few individuals wander north each year into southern areas of Canada.

Subspecies - There are over 30 recognized subspecies in the world some of which have recently been elevated to full species status. Only 1 race is found in North America.

*Tyto alba pratincola* - occurs throughout North America including offshore islands.

The Barn Owl occurs throughout the world except China, Mongolia, Korea, Japan, Taiwan, Borneo, the Philippines, Iran, Afghanistan, most of Russia, Greenland, Iceland, northern Canada, Scandinavian countries, New Zealand and Antarctica.

#### BEHAVIOR

The Barn Owl has a light, buoyant, and graceful flight with slow wing beats. When hunting the owl quarters, or shifts from side to side, flying about 10 feet (3 meters) above the ground. It may also hunt from perches such as trees and posts.

Of all owls in North America only the Barn Owl can hunt in total darkness. Although it can see well in daylight, and catch food especially when feeding young, it prefers to hunt at

night, primarily by sound. Its ears are asymmetrical which allows sounds of rustling mice to arrive at each ear at slightly different times and different intensities. When the sound intensities are the same in each ear, the owl is ready to pounce.

The Barn Owl is essentially non-migratory and is well known for its reluctance to move from an area. In northern areas, however, there may be a partial southward movement of owls in the period August to December and a return northward movement in March and April. There is some local dispersal, mainly of juveniles. Banding results indicate that well over half of these birds were found within 50 miles (80 kilometers) of where they were banded as nestlings. The longest distance traveled by a single bird was 1,075 miles (1,740 kilometers).

Because the Barn Owl is not very territorial, except around the nest site, conflicts between individuals are rare. Near their breeding or roost site it prefers to slip away unnoticed. If surprised the owl will crouch forward, ruffle the body feathers and spread the wings followed by a short hissing or bill clacking.

The size of an area needed to support a pair of Barn Owls varies with availability of food, but even when mice and rats are scarce a pair needs about 1 square mile (2.5 square kilometers) of favorable habitat to live. In some situations up to 38 Barn Owls can live together in loose colonies, and breed, but hunting areas may be as far away as 2 miles (3 kilometers).

During nesting the male Barn Owl moves away to a nearby roost site always with the nest area in full view. These may include a nearby building or large stand of conifers. In winter favorite roost sites are located near hunting grounds.

For a bird of prey the Barn Owl is a short-lived bird. Most die in their first year of life with the average life expectancy of between 1 and 2 years. In North America the oldest Barn Owl in the wild lived to be 11 years, 6 months; in Holland one lived to be 17 years, 10 months old.

## ADAPTATIONS

The nocturnal Barn Owl is designed for darkness with the senses of sight and hearing being most developed. Although its eyes are smaller than those of other owls it has more light sensitive rod cells inside its eyes which allows it to see better in darker situations. The eyes can also adjust very quickly, letting the Barn Owl keep its prey in constant focus; and with binocular vision of 70% through both eyes it can scan a wide area for food and enemies.

The Barn Owl is the only species that can catch prey in total darkness. It can hear a mouse squeaking, chewing on leaves, or rustling about leaves using its stiff mat of feathers on the facial disk combined with its asymmetrical ears. Sounds are actually received in its "satellite dish" and routed to the ears for pinpoint detection of prey.

Another important adaptation is the owl's very large wing area in relation to its weight. The wings are broad, long and rounded, which provides great lift and maneuverability. This enables the owl to fly very slowly, without stalling, which means it can search the environment more thoroughly, and without noise, for food.

## HABITAT

The Barn Owl avoids mountainous and heavily forested areas and prefers open and semi-open country at low elevations. It is often found around human habitations, especially

agricultural areas, but also occurs in deserts, salt-water, brackish, and fresh-water marshes, grasslands, and cities.

## VOICE

Vocalizations are extremely varied and uttered mainly during the breeding season. Typical calls include: (a) screams described as a drawn-out karr-r-r-r-ick and used as a conversational or distress song; (b) snores described as a variable wheezing scheuh and used for self-advertising; (c) hisses described as a long loud call to intimidate predators; (d) chirrups and twitters uttered when feeding, and; (e) beak snapping or clicking uttered when in an alarmed state.

## PELLETS

The pellet is dark gray and cylindrical in shape; shiny when just regurgitated. One pellet contained the remains of 13 small mammals including 12 shrews and one field mouse. Usually 2 to 3 field mice skulls can be found in one pellet. The pellet size ranges from 0.75 to 2.75 inches (1.9 to 7.0 centimeters) in length (average 1.25 inches [3.2 centimeters]) and from 0.50 to 1.25 inches (1.3 to 3.2 centimeters) in width (average 1.00 inch [2.5 centimeters]).

## FOODS

The Barn Owl relies heavily on small mammals. In an analysis of 51 food studies in North America involving 73,359 prey items, small mammals accounted for nearly 98% of all foods. Rodents (86%) and insectivores (11%) are the most important mammal groups. Of these, voles (field mice) are the single most important food (65%) followed by shrews, deer mice and rats. Few birds are taken as prey.

The diet of the Barn Owl becomes more varied from north to south. Voles are the primary source of food in northern areas including the Pacific coast, the northeastern Atlantic coast, and the mid-western states of Idaho, Utah, and Colorado. In southern areas, including South Carolina, Oklahoma, Texas, and Louisiana two kinds of rats, the Cotton Rat and Rice Rat, are the primary foods.

## NESTING

The Barn Owl will nest almost anywhere but seems to show a preference for human-made structures such as barns, silos, abandoned buildings, active apartment buildings, bridges, water towers, duck blinds, and nest boxes. It also nests underground in abandoned burrows of mammals, old mine shafts, and water wells as well as in natural cavities in trees, cliffs, and banks. Sometimes it lays its eggs in unused nests of other birds like crows, magpies, and hawks.

No actual nesting material is used, although pellets often serve as a saucer for the eggs.

The Barn Owl usually begins nesting in late January in southern areas and March and April in northern areas. However, it may nest throughout the year if rodents are abundant. In this situation two, sometimes three, broods may be raised each year.

The number of eggs a Barn Owl lays each season varies greatly, depending on food supply. Clutch sizes can range from 2 to 13 eggs but usually 5 to 7 are laid. The eggs are laid at two- to three- day intervals with incubation commencing with the first egg. Thus, in a clutch of 6 eggs there could be a two week difference in hatching time. The male brings food to the female while she incubates the eggs for 30 to 33 days. A few days before hatching the

chick peeps inside the egg. The female becomes quite excited and waits patiently for the chick to work its way out of the egg. This may take up to 48 hours. It may take another 50 to 60 days before the young are able to leave the nest. The entire breeding cycle takes between 3 and 4 months.

If a clutch is disturbed early in the incubation process a second can be laid, but usually at a different nest site.

## CONSERVATION

Populations and density vary greatly depending on abundance of prey, nest sites, and availability of quality habitat. Some areas are showing declines locally, others are showing increases, mainly due to nest box programs.

Natural mortality results from severe winter weather, collisions with automobiles, trains, power cables, wires, and fences, drowning, diseases, and predation, mainly from Great Horned Owls.

Nearly 30% of states and provinces in North America list the Barn Owl as a species of management concern; many even list it as an endangered species. Pesticides, responsible for egg-shell thinning, and rodenticides, which causes direct death, may in part be responsible. The clearing of forested lands for agriculture may have initially aided the Barn Owl in its spread to occupy suitable habitat but urbanization is now an increasing threat.

Fortunately this owl is very adaptable, and as long as suitable foraging sites with abundant small mammals are nearby, nest boxes can be erected to provide it with a place to raise its young and shelter it from inclement weather.

The Barn Owl is among the most valuable birds on the continent as most of its diet includes small mammals that are injurious to man and his crops. For example, a single family of Barn Owls will eat over 2,000 voles each year.

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# Barred Owl

*Strix varia*

## General Description

The Barred Owl is a large, nocturnal, woodland owl with the most distinctive call of all North American owls. It is round-headed, without ear tufts, short-tailed and tends to sit erect with its head pulled in. The grayish-brown plumage is distinctly barred with white on the throat, upper chest, back, head, wings, and tail. Vertical bars run down the lower chest, belly and flanks. The gray facial disk is lightly marked with brown concentric rings. The eyes are dark brown and its beak and feet are dull yellow. In flight it appears light and buoyant, but its wingbeats are slow and deep.

## Size

The Barred Owl is the fourth largest North American owl. Females are 10 to 20% larger than males. Lengths average 20 inches (51 centimeters) for females and 19 inches (48 centimeters) for males. Wingspans average 44 inches (111 centimeters) for females and 42 inches (107 centimeters) for males. Weights average 1.75 pounds (801 grams) for females and 1.4 pounds (632 grams) for males.

## Morphs

Barred Owls are monotypic, with relatively little individual variation in overall plumage color or pattern.

## Specific Description

### Adult

- refer to above
- distinctly barred rather than spotted
- large owl with brown eyes and without ear tufts

### Juvenile

- similar to adults but bars are buffy rather than white.

## Similar Species

The Great Gray Owl is a large, grayish, earless owl but it has yellow eyes, a relatively long tail, and a white "mustache" mark under its facial disk. The Spotted Owl is found in dense old-growth forests whereas the Barred Owl is found mainly in mature or disturbed forests. The Spotted Owl is darker, richer brown, and is spotted rather than barred.

## Other Names

It has also been known as Northern Barred Owl, Swamp Owl, Striped Owl, Hoot Owl, Round-headed Owl, Le Chat-huant du Nord (Fr: "The Hooting Cat of the North"), Wood Owl, and Rain Owl.

## Etymology

The scientific name *Strix varia* translates into "variegated or diverse screech owl".

## Mythology



No information available.

## RANGE

North America - Recently expanding its range in western North America. Resident from southeastern Alaska, British Columbia (except the Queen Charlotte Islands), western Washington, western Oregon, and northern California east through northern Idaho, western Montana, central Alberta, central Saskatchewan, southern Manitoba, central Ontario, southern Quebec, New Brunswick, Prince Edward Island, and Nova Scotia south through the Great Plains (west to South Dakota), eastern Nebraska, central Kansas, and central Oklahoma, to central and southern Texas, the Gulf Coast, and southern Florida.

Northern populations may be partially migratory depending on food resources.

Subspecies - There are 4 recognized subspecies of this owl, 3 of which reside north of Mexico.

*Strix varia georgica* - occurs from central Arkansas east to North Carolina and south to eastern Texas and southern Florida.

*Strix varia helveola* - occurs only in south-central Texas.

*Strix varia varia* - the most widely distributed race that occurs from southeastern Alaska and British Columbia east to Nova Scotia, south through the eastern Great Plains to Oklahoma and east to Virginia.

The Barred Owl also occurs in Mexico.

## BEHAVIOR

The Barred Owl roosts during the day in thick foliage of trees and will allow close approach by humans. It is more aggressive in defense of its nest than Spotted Owls, but will not attack humans like the Great Horned Owl. It often flies through the top of the forest canopy and makes long glides low to the ground.

The Barred Owl hunts mainly from dusk to dawn but will hunt during the day when feeding young. It hunts by the "sit and wait" method, gliding down on prey after it is noticed, or by flying through the forest and pouncing on any prey that moves. Birds are taken as they settle into nocturnal roosts, because the Barred Owl cannot catch birds on the wing. It will wade into water and fish for small fish, similar to the larger Great Horned Owl. The Barred Owl is attracted to campfires and lights where it forages on large insects. Prey is usually devoured on the spot. Larger prey is carried to a feeding perch and torn apart before eating.

The Barred Owl is resident throughout most of its range, but northern populations move southward during late autumn. Adults tend to remain near their nesting sites throughout most of the year. Young tend to disperse very short distances, usually less than 6 miles (10 kilometers), before settling. Pairs mate for life and territories and nest sites are maintained for many years. Average home ranges in various studies were about 620 acres (250 hectares), but only about half of the area, centered around the nest, is used during the spring and summer. Densities in good habitat can reach 2.5 pairs per square mile (1 pair per square kilometer).

This is a long-lived owl with wild owls of over 10 years and captive owls of 23 years being known. Little is known of mortality in the wild. Most mortality is likely directly or indirectly related to man (shootings, roadkills). It has almost no natural enemies, except the Great Horned Owl. It will avoid small woodlots that are used by Great Horned Owls, but can

coexist in larger forests by using areas less frequented by Great Horned Owls.

The Barred Owl calls year-round but courtship activities begin in February. Males hoot and females give contact calls. As the nesting season approaches, males chase after females giving a variety of hooting and screeching calls. Males display by swaying back and forth, and raising their wings, while sidling along a branch. Courtship feeding and mutual preening also occur. Barred Owls seem to enjoy having their heads scratched, even by humans.

### Adaptations

The Barred Owl has relatively good daytime vision, although it is mainly nocturnal. Its ear cavities are large and asymmetrically placed which allows it to capture prey in the dark by hearing alone. It may not fly on very dark nights. This owl frequents broken forests, or dense forests with openings, so it is capable of inhabiting dense coastal forests that have been opened up by logging. Recent range expansions to the west coast are thought to be related to this adaptability.

### HABITAT

The Barred Owl inhabits mixed coniferous/deciduous and deciduous forests. It tends to occur in forests along the edges of clearings or waterways, and in swamps, semi-open woodlands, and isolated woodlots. The Barred Owl likes nearby water sources for drinking. It requires mature forests with some large trees for nesting, dense trees for roosting, a multi-layered canopy, and without a dense understory. Its habitat must contain large stick nests made by hawks or corvids, natural cavities in the ends of broken limbs or snags, or squirrel nests for nesting sites. Hunting is done mainly along the forest edge or in clearings, but it will hunt in residential and industrial areas. The Barred Owl roosts in dense trees, usually on a branch next to the trunk.

### VOICE

The Barred Owl is vocal throughout the year, with peaks of calling in late winter and spring and then again in early autumn. The primary advertisement call is a distinctive "hoo, hoo, too-HOO; hoo, hoo, too-HOO, ooo", which is often phrased as "Who, cooks, for-you? Who, cooks, for-you, all"? The last syllable drops off noticeably. This call is used for territorial and courtship purposes. Mates will duet, but the male's voice is deeper and mellower. Other calls include "hoo-hoo, hoo-WAAAHH" and "hoo-WAAAHHH". The Barred Owl also cackles, coos, whistles, shrieks, barks, and grunts.

### PELLETS

Pellets are about 2 to 3 inches (5.1 to 7.6 centimeters) long, with numerous bones, skulls, and teeth, and are held together by fur, feathers, and mucus.

### FOODS

The Barred Owl is an opportunistic forager and eats a wide range of prey. Mammals are its primary target and meadow voles are its main prey, followed by shrews and deer mice. Other mammals include rats, squirrels, young rabbits, bats, moles, opossums, mink, and weasels. Birds are taken occasionally, including woodpeckers, grouse, quail, jays, blackbirds, pigeons, screech-owls, and Long-eared Owls. It also eats small fish, turtles, frogs, snakes, lizards, crayfish, scorpions, beetles, crickets, and grasshoppers.

### NESTING

The Barred Owl nests primarily in large stick nests or cavities in trees. In eastern North America it occurs in the same habitat as the Red-shouldered Hawk, and frequently uses that species' nest for its own. There are even records of the Barred Owl laying eggs in an active Red-shouldered Hawk nest. It also nests in old squirrel nests, in rock crevices, or on the ground. Nests are usually near forest openings. Nest boxes are also used, but the entrance must be at least 8 inches (20.3 centimeters) wide. Small amounts of nest lining material may be brought in.

Clutch size ranges from 2 to 4 eggs with most clutches containing 2 eggs. Average clutch sizes increase slightly from south to north. Eggs are likely laid every 2 to 3 days and incubation begins with the first egg laid. The incubation period is 28 to 33 days. Females likely perform all incubation with males bringing food to the nest. Nestlings begin to leave the nest at about 4 weeks and move out onto nearby branches. They are capable of weak flight after about 6 weeks. Parents care for the young for at least 4 months, much longer than most other owls.

The Barred Owl is single-brooded but has a long breeding season, which allows for laying of replacement clutches if the first clutch or brood is lost.

## CONSERVATION

The Barred Owl is very beneficial to man because of the high percentage of small rodents in its diet. It is relatively adaptable for a large owl and can breed successfully in smaller woodlots, and forests opened up by logging and agriculture. It requires some old-growth trees for nest sites, and has probably declined in eastern North America where most mature forests have been eliminated.

The Barred Owl is now expanding its range westward and southward on the Pacific coast and is coming into contact with the more specialized Spotted Owl. It is known to displace and hybridize with Spotted Owls, which may be cause for concern in the long-term future of the Spotted Owl.

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# Boreal Owl

*Aegolius funereus*

## General Description

The Boreal Owl is a small, nocturnal, seldom-seen woodland owl of northern and western boreal forests. It tends to sit slightly leaned forward and its compact, "earless" plumage gives it a streamlined look. Its chocolate brown background plumage is thickly spotted with white on the forehead, crown, nape, and wings. Its underparts are marked with broad irregular white streaks. Its yellow eyes are set in facial disks that are blotched with white, gray and brown. It has prominent white "eyebrows", a horn yellow bill, and heavily feathered legs and feet.

## Size

The Boreal Owl is the tenth largest North American owl. Females are slightly larger than males. Lengths average 10 inches (26 centimeters) for females and 9.5 inches (24 centimeters) for males. Wingspans average 24 inches (61 centimeters) for females and 23 inches (59 centimeters) for males. Weights average 7.9 ounces (224 grams) for females and 7.4 ounces (211 grams) for males.

## Morphs

The Boreal Owl is monotypic with little individual variation in plumage.

## Specific Description

### Adult

- refer to above
- thickly spotted with fine dots of white on head
- head appears overly large for body

### Juvenile

- wings and tail similar to adults
- underparts and upperparts a uniform dark brown
- face blackish with whitish "eyebrows"

## Similar Species

The Boreal Owl can be confused with the Northern Saw-whet Owl but is about 25% larger, is darker overall, has fine spots rather than fine streaks on its head, and has a yellowish rather than grayish bill.

## Other Names

It has also been known as Richardson's Owl, Death Bird, Sparrow Owl, Tengmalm's Owl (in Eurasia), Arctic Saw-whet Owl, and Phillip-Pie-Tschsh (Montagnais Indian: "Water Dripping Bird").

## Etymology

The scientific name *Aegolius funereus* translates into "funereal bird of ill omen".

## Mythology

The Cree people believed Boreal Owl whistles were summons from the spirits. If a person answered with a similar whistle and did not hear a response, then he would soon die. Inuit people named this owl "the blind one", because of its tameness during daylight. Inuit children also make pets of Boreal Owls.

## RANGE

North America - Breeds in boreal forests to tree line from central Alaska, central Yukon, southern Mackenzie, northern Saskatchewan, northern Manitoba, northern Ontario, central Quebec and Labrador, south through interior British Columbia, central Alberta, central Saskatchewan, southern Manitoba, northeastern Minnesota, western and central Ontario, southern Quebec, and New Brunswick. It also breeds locally in the mountainous regions of Idaho, Montana, Wyoming, Colorado, and New Mexico.

Winters generally in breeding range but wanders south in some years to northern United States, occasionally to southern Oregon, Illinois, Pennsylvania, and New Jersey.

Subspecies - There are 7 recognized subspecies in the world, only 2 of which have been found in North America.

*Aegolius funereus magnus* - only 1 occurrence of this race which is resident in northeastern Siberia.

*Aegolius funereus richardsoni* - resident only in North America.

The Boreal Owl also occurs widely in northern Eurasia.

## BEHAVIOR

The Boreal Owl is an inconspicuous resident of remote boreal forests. It is seldom seen by humans but is quite tame when found. In flight, it moves directly with rapid wingbeats. When approaching its nest cavity it will hover mothlike before entering. When roosting it perches on a branch next to the trunk, rarely out on a branch.

The Boreal Owl hunts mainly nocturnally but may hunt during daylight hours on cloudy days as well. It is a "sit and wait" predator that locates prey mainly by hearing. It usually perches near a meadow or small forest clearing and flies down directly when prey is spotted, even crashing through low shrubs to reach its target. Moving prey is usually taken rather than stationary prey. Prey is struck in the body with both sets of talons simultaneously. Prey is carried off in its talons to feeding perches. Excess food is cached in safe places and, in winter, is thawed out later by "brooding" the frozen carcass.

The Boreal Owl is nonmigratory except during severe winters or during food shortages when some southward movements take place. Irruptive movements southward probably occur during low rodent population cycles. Some nonterritorial birds wander widely. In Colorado, breeding season home ranges average about 740 acres (300 hectares). Several studies have recorded winter home ranges of 2,700 to 3,700 acres (1.1 to 5 square kilometers). Only a small area around the nest site is actually defended during the nesting season from other Boreal Owls, so that ranges may be largely overlapping, especially during winter.

Little is known about longevity or mortality. This owl competes with Northern Saw-whet Owls and flying squirrels for nest cavities and is preyed upon by larger owls, marten, and the Northern Goshawk. In winter, it is attracted to baits on traplines and many are killed when they spring the trap.

The Boreal Owl breeds as one-year old birds. Some birds reuse nesting sites in consecutive years but others nest as far as 300 miles (500 kilometers) from their previous year's nest. Pairs are usually monogamous, but are occasionally promiscuous. One male will mate with two females and father two different broods and females will occasionally try to raise two broods with different males.

Males begin to sing their advertisement song in mid February. A population of males may sing for as long as four months, but individual males sing for only 1 to 7 weeks. Singing occurs at night, more often on clear, calm, moonlit nights and less often on windy, rainy nights. Males perform aerial courtship displays of dips, dives, and tight circling over females that are perched on a tree.

When threatened, the Boreal Owl performs a strange slimming action where it elongates its body, raises its facial disks into shallow horns, and raises the near wing to its bill. This behavior is thought to help conceal the owl by making it look like a tree branch. It may also feign sleeping when approached, before flying off suddenly.

### Adaptations

The Boreal Owl's ear cavities are extremely asymmetrically placed, which aids in detection of prey by hearing alone. It is thought that nest hole availability, food abundance, and nest predation will affect mating strategies of this owl with double brooding occurring when food abundance is high and nest sites are plentiful.

### HABITAT

The Boreal Owl inhabits a range of forests from pure coniferous to pure deciduous forests. Preferred habitat varies throughout its range but includes mainly oldgrowth forests with woodpecker cavities for nesting. Southern populations tend to occur in high subalpine forests. In Colorado, it frequents spruce, fir, and aspen forests between 9,200 to 10,500 feet (2,800 to 3,200 meters) elevation and is most numerous where the forest is interspersed with meadows. In Ontario, oldgrowth mixed forests are preferred. In western Montana and Idaho they are found in oldgrowth spruce/fir forests above 5,000 feet (1,500 meters). Boreal owls are dependent on woodpecker cavities for nest sites. Hunting habitat includes forest meadows and open forests. When roosting it needs dense conifers like Englemann spruce or balsam fir where it roosts 16 to 20 feet (5 to 6 meters) up.

### VOICE

The male Boreal Owl's primary advertisement song is the "staccato song", a whining trill that lasts about 1.3 to 2.3 seconds, with about 12 notes/second. It most closely resembles the winnowing noise of the Common Snipe. It is quite loud and will carry up to 2 miles (3 kilometers) on clear, still nights. Singing often occurs when the male is sitting in his nest hole, especially when a female enters his territory. A muted version of the primary song is used for contacting the female or announcing the presence of an intruder. The male gives a brief trill when passing prey to the female or young. A loud "hoo-up", that varies from sounding like a child's cry to a creaking tree, is given when the male arrives at the nest with prey. Nestlings chirp and peep to beg for food.

### PELLETS

Pellets are small, about 1.5 inches (3.8 centimeters) long and 0.75 inches (1.9 centimeters) thick, and gray. They are ejected away from nests or roosts at the rate of 1.2 per day. They are often ejected prior to leaving their day roost.

## FOODS

Food is primarily small rodents (90 to 98% of diet) and small birds (2 to 10%). In most areas, forest (mainly red-backed voles) and meadow voles are the major prey, but deer mice and shrews are often taken as well, and may be the primary prey in local areas. If voles numbers are low, shrews and birds tend to become more important foods. Other small mammals include moles, lemmings, squirrels, chipmunks, weasels, pocket gophers, picas, woodrats, and young snowshoe hares. Bird prey includes thrushes, warblers, crossbills, chickadees, redpolls, woodpeckers, and kinglets. A few insects such as crickets, moths, grasshoppers, and beetles are taken occasionally, as are the odd frog or salamander.

## NESTING

The Boreal Owl nests in old woodpecker cavities, primarily excavated by Northern Flickers and Pileated Woodpeckers, or natural cavities. Nests are usually in conifer snags, aspens or birches, and range from 10 to 55 feet (3 to 17 meters) above ground. Nesting occurs from April to June.

Clutch size ranges from 3 to 8 eggs, with an average of 4 to 5 eggs. The female does all incubation and the male brings food to the nest. Eggs are laid every second day, and incubation begins with the first or second egg laid. The incubation period averages 28.5 days. Young fledge at 4 to 5 weeks and are independent of their parents after 5 to 6 weeks.

The Boreal Owl is usually single-brooded, but some birds try to produce 2 broods. Breeding success is fairly high. Desertion or predation of eggs and young are the primary causes of nest failure.

## CONSERVATION

Clear-cut logging of subalpine and montane forests reduces habitat by removing forest cover and snags used for nesting. Populations may be retained in selectively logged areas, especially if snags useful for nesting are retained. In Eurasia, nest boxes have proven useful for nest sites, but there has been little success in attracting this owl to nest boxes in North America.

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# Burrowing Owl

*Athene cunicularia*

## General Description

The Burrowing Owl is a small, uncommon, earless owl that inhabits wide-open prairie habitats. It habitually stands erect on the ground or fenceposts where its lightly-feathered and long legs, short tail, and knock-kneed stance, give it a gangly long-legged appearance. Its plumage is an overall dark sandy color, with lighter underparts barred with brown, and profusely spotted with white on the head, back, and wings. It has poorly developed facial disks. In flight its wings are relatively long and narrow, making it appear smaller than when perched. Its eyes have a bright yellow iris.

## Size

The Burrowing Owl is the 11th largest owl in North America. Females are slightly larger than males. Lengths average 10 inches (25 centimeters) for females and 9 inches (23 centimeters) for males. Wingspans average about 23 inches (58 centimeters) for females and males. Weights average 7.5 ounces (214 grams) for females and 7.2 ounces (203 grams) for males.

## Morphs

The Burrowing Owl is monotypic, with relatively little individual plumage variation.

## Specific Description

### Adult

- refer to above
- earless round head, sandy color, and erect long-legged stance are diagnostic

### Juvenile

- similar to adults but have more uniform color and less spotting
- throat band a uniform brown

## Similar Species

The Burrowing Owl is difficult to confuse with any other bird. The Short-eared Owl is another owl that perches on the ground and fenceposts in open areas, but it sits horizontally, rather than erect, and has broad wings and obvious facial disks.

## Other Names

The Burrowing Owl has also been known as Ground Owl, Prairie Dog Owl, Rattlesnake Owl, Howdy Owl, Cuckoo Owl, Tunnel Owl, Gopher Owl, and Hill Owl.

## Etymology

The former scientific name *Speotyto cunicularia* translates into "cave owl miner" which refers to its habit of nesting and roosting underground. The recent name change in genus *Speotyto* to *Athene* translates from Greek mythology to the goddess of wisdom and war. The owl was her favorite bird which was associated from her primitive role as goddess of the night.

## Mythology

The Hopis Indians see this owl as their god of the dead, the guardian of fires and tender of all underground things, including seed germination. The Dakota Hidatsa Indians saw the Burrowing Owl as a protective spirit for brave warriors. A Zuni legend tells of how this owl got its speckled plumage: the owls spilled white foam on themselves during a ceremonial dance because they were laughing at a coyote that was trying to join the dance. European pioneers were tricked by this owl's ability to swivel its head and thought it would ring its own neck if a person circled the owl. Contrary to some popular belief, this owl does not have friendly relations with prairie dogs or rattlesnakes.

## RANGE

North America - Breeds from south-central British Columbia, southeastern Alberta, southern Saskatchewan, southwestern Manitoba, south through eastern Washington, central Oregon and California to Baja California, east to western Minnesota, northwestern Iowa, eastern Nebraska, Kansas, Oklahoma and Texas south to southwestern Louisiana; also resident in Florida.

Winters generally throughout the breeding range but variably migratory in northern parts of its range. Generally present year-round in southern parts of the United States.

Subspecies - There are 4 recognized subspecies of this owl, two of which reside in North America.

*Athene cunicularia floridana* - restricted to Florida.

*Athene cunicularia hypugaea* - range as described above, exclusive of Florida.

The Burrowing Owl also occurs locally in Central and South America south to Tierra del Fuego, and on Cuba, Hispaniola, the lesser Antilles, Bahama Islands, and on islands in the Pacific Ocean off the west coast of Mexico.

## BEHAVIOR

The Burrowing Owl nests and roosts in underground burrows, a unique behavior in owls. It flies with irregular, jerky wingbeats that somewhat resemble an American Kestrel. It frequently makes long glides, interspersed with rapid wingbeats. It hovers during hunting and courtship, and may flap its wings asynchronously.

The Burrowing Owl is an opportunistic feeder that hunts at any time of the day or night. It hunts both by searching for prey while perched on soil mounds around its burrow or on a fence-post. Prey spotted from a perch is pounced on after a direct flight. When hunting while in flight, it may hover over tall or dense vegetation. Burrowing Owls also hawk insects in midair and chase them down on foot. It carries most prey in its beak. Large insects captured with its beak in flight, are transferred to its talons in midair. All prey is carried back to a burrow to be eaten or stored. This owl also circles around large mammals, waiting for the animals to be scared up.

Northern populations are migratory, with individual exceptions, whereas central and southern populations are year-round residents. Some Burrowing Owls, especially males, return to their previous nest burrow but others disperse to new areas. Reforming of pairs in consecutive years is less common than in other owls. This owl is the most gregarious of all owls, being quite tolerant of other Burrowing Owls and even nesting semi-colonially in some sites. Breeding densities have reached as high as 1 pair/9 acres (3.5 hectares). Home ranges around nest sites range from 35 to 1,200 acres (0.14 to 4.8 square kilometers). They

sometimes nest within active prairie dog or ground squirrel colonies.

This owl is known to live for at least 9 years in the wild and over 10 years in captivity. Mortality rates are not well-known but this owl is often killed by vehicles when crossing roads. It is also preyed on by larger owls, hawks, falcons, badgers, skunks, ferrets, armadillos, snakes, and domestic cats and dogs.

Burrowing Owls are usually monogamous but occasionally a male will have 2 mates. The males perform display flights, rising quickly to 100 feet (30 meters), hovering for 5 to 10 seconds, then dropping 50 feet (15 meters). This sequence is repeated many times. Circling flights also occur. On the ground, males walk up to females on the burrow mound where they snuggle, preen each other, and rub bills. Copulation occurs in the burrow.

When this owl notices something unusual it begins to bob its body, swivels its head back and forth, and gives a warning call. When directly threatened it either flies away a short distance to another perch or retreats into its burrow.

### Adaptations

Its high breeding success suggests it is advantageous for a small, otherwise vulnerable owl, to nest in the protected environment of underground burrows. It is active at all times of day, unlike all other North American owls, and its hearing and vision are equally adapted for night and day use.

### HABITAT

The Burrowing Owl is restricted to open grasslands, prairie, and savannas. It inhabits only sparsely vegetated or heavily grazed areas. It also occurs in human-made open areas such as vacant lots, fallow farm fields, and airport fields. In all areas, it is almost entirely dependent on burrows excavated by mammals such as prairie dogs, rock squirrels, badgers, armadillos, rabbits, and tortoises (Florida). They occasionally excavate their own burrows or use natural cavities in rock, abandoned culverts, or other openings in the ground. Nesting areas must have both burrows and perch sites such as fences, earth mounds, poles, or low shrubs. Sandy sites are often preferred because burrows are more easily modified by the owls.

### VOICE

The Burrowing Owl has one of the largest repertoires of sounds of all North American owls, at least 17 different vocalizations. The male's primary song is a musical "coo-coo", repeated every 0.6 seconds, and used during pair formation, precopulatory behavior, and territory defense. This call is uttered mainly at night, but only when the male is near its burrow. Females utter a warble or "smack" during copulation. Both sexes cluck, scream, and chatter "tweee-chikit-chikit-chik" when excited. The female gives a "rasp" call when accepting food from the male, passing food to young, or when giving an all-clear signal to young. Nestlings give an "eep" when hungry or slightly disturbed, a "rasp" when being fed, and a "rattlesnake rasp", that resembles a rattlesnake's rattle, when severely disturbed or facing a predator. Communally nesting owls often chatter back and forth.

### PELLETS

Pellets are small, about 1 inch (2.5 centimeters) long and 0.75 inch (1.9 centimeters) thick, smooth and brown colored.

### FOODS

The Burrowing Owl eats mainly insects, small mammals, and small birds. Large insects like beetles, grasshoppers, locusts, crickets, centipedes and dragonflies are favored prey. Near wetlands it also eats small amphibians and reptiles. Unlike other owls, it also eats fruits and seeds, especially the fruit of *Tesajilla* and prickly pear cactus. Mammals include mice, rats, ground squirrels, gophers, chipmunks, shrews, young prairie dogs and rabbits, and bats. Horned Larks are favored bird prey but larger birds up to the size of Mourning Doves are also taken. In northern wintering areas, small mammals become more important because large insects become less abundant then. One wintering owl on southern Vancouver Island ate mainly earwigs.

## NESTING

The Burrowing Owl nests solely in underground burrows or crevices (see Habitat). Burrows slope gradually downward, may be 13 to 33 feet (4 to 10 meters) long, and always have a sharp bend in the tunnel to ensure a dark nest chamber. It will also nest in artificial burrows placed by man. In migratory populations, males clean out nest burrows soon after they are reoccupied in the spring and then line the nest chamber and burrow entrance with mammal droppings or other refuse. Nest chambers are enlarged by the male scratching with its feet. Residents populations occupy burrows year-round.

Clutch size ranges from 6 to 12 eggs, but averages only 7 to 9 eggs. Eggs are laid daily and incubation begins with the first egg laid. The female performs all incubation while the male provides food and nest defense. The male often caches food near the nest during this time. The incubation period is 27 to 30 days. Young fledge at about 45 days, but begin to venture out above ground after only 14 days. Family groups sit together on earth mounds around the burrow.

The Burrowing Owl is single-brooded but will lay a replacement clutch if the first is lost.

## CONSERVATION

The Burrowing Owl is one of the most threatened of North American owls. It is listed as endangered, threatened, or a species of special concern in most states and provinces where it occurs.

Most populations are thought to be in serious decline. Certainly, some populations have been extirpated. Local increases in California and Arizona are encouraging. The Florida population numbers as high as 10,000 birds and is increasing its range northward, following human-made habitat alterations. Several recovery programs are in effect with artificial burrows being placed and transplanted birds being released. These programs have had mixed success.

Most conservation problems are caused by destruction of habitat by urban development and agricultural activities. Land protection plans are best conservation method. For example, 99,000 acres (40,000 hectares) of habitat used by 650 pairs have been reserved in Saskatchewan. Vegetation management through grazing or fire that increases open areas, will enhance habitat. Carbofuran insecticide is lethal to Burrowing Owls and has now been banned for use in Canada within 820 feet (250 meters) of active burrows.

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# Elf Owl

*Micrathene whitneyi*

## General Description

The Elf Owl is a tiny, relatively common, nocturnal owl of the arid southwestern United States and Mexico. It sits fairly erect and has a knock-kneed stance, similar to the Burrowing Owl. It has a round head with no ear tufts, and short tail. Its puffy plumage is brownish-gray overall, and is washed with white on the belly and cinnamon on the face. Cinnamon or buffy spots dot its forehead and wings. An irregular white stripe runs down the scapular feathers, irregular white spots run along the outer edge of its folded wings, and a broken white collar runs along the lower nape. Its short tail is barred with 4 to 5 horizontal buffy stripes. Its feet and legs appear naked but are sparsely covered with bristly feathers. Its eyes have lemon-yellow irises that are highlighted by thin white "eyebrows". The bill is gray with a horn-colored tip. In flight it has rounded wingtips and stubby tail.

## Size

The Elf Owl is the smallest owl in the world, about the size of a sparrow. Females are slightly larger than males. Lengths average 6.1 inches (16 centimeters) for females and 5.8 inches (15 centimeters) for males. Wingspans average 15 inches (38 centimeters) for females and 14.6 inches (37 centimeters) for males. Weights average 1.5 ounces (44 grams) for breeding females.

## Morphs

There is only one plumage type in this owl. Sexes are alike and there is relatively little individual variation in plumage color.

## Specific Description

### Adult

- refer to above
- very tiny size and short tail are distinctive
- white scapular streak, legs covered with bristly feathers

### Juvenile

- similar to adults but crown is a uniform brown-gray without spots
- face grayer than adults without ruddy flecks

## Similar Species

The Elf Owl could be confused with the Ferruginous Pygmy-Owl because of its similar size and habitat use. However, the Elf Owl is grayer and less rufous, and has a shorter tail than the Ferruginous Pygmy-Owl. It is also not active during daylight hours, as are the pygmy-owls.

## Other Names

It has also been known as Texas Elf Owl, Whitney's Elf Owl, and Dwarf Owl.

## Etymology

The scientific name *Micrathene whitneyi* translates into "Whitney's small owl". Mr.

Whitney was either JD Whitney, a California geologist, or H.P. Whitney, a philanthropist who sponsored expeditions to the Pacific coast.

## Mythology

No information available.

## RANGE

North America - Breeds from extreme southern Nevada, southeastern California, central Arizona, southwestern New Mexico, extreme western and southern Texas southward into Mexico.

Winters in Mexico.

Subspecies - There are 4 recognized subspecies of this owl, but only 2 occur in the United States.

*Micrathene whitneyi idonea* - occurs locally only in the lower Rio Grande Valley of extreme southern Texas.

*Micrathene whitneyi whitneyi* - occurs locally in Lower Colorado River Valley, southern Arizona, southwestern New Mexico, and southwestern Texas.

The Elf Owl also occurs in Baja California and Mexico.

## BEHAVIOR

The Elf Owl is a nocturnal owl that hunts mainly at dusk and dawn. It flies somewhat bat-like, but not as erratically, and avoids flying during strong winds. It is occasionally attracted to campfires or other bright lights where it searches for flying insects.

The Elf Owl hunts small, defenseless prey because it has relatively weak feet and talons, in marked contrast to the similar-sized pygmy-owls. Most prey is captured in flight as this owl is very maneuverable in flight. It hunts mainly by flying out from perches on trees, shrubs, or cacti to hawk flying insects or by flying over open ground. It often hovers over insect prey, causing it to take flight, then captures the prey in mid air. The Elf Owl also plucks insects from tree branches or the ground without alighting, and forages by walking on the ground. Prey are carried to a nearby perch, where they are torn apart before being eaten.

Of all North American owls, only the Flammulated Owl is more migratory than the Elf Owl. Arizona populations of Elf Owls migrate into Mexico by early October. The return spring movement occurs mainly in March. Migration is thought to be necessary because there are few insects active at night during cold Arizona winter nights. Males precede females during the spring migration, and early-arriving males set up territories at lower elevations, forcing late-arriving males to occupy higher elevations. Texas birds are thought to be resident. Territories during the breeding season are extremely small compared to other small owls. Nesting owls confine themselves to an area between only 65 and 230 feet (20 and 70 meters) from the nest. Breeding densities are very high for owls, as many as 11 pairs/square mile (4.6 pairs/square kilometer).

There is little information available on mortality or longevity. Captive Elf Owls have lived for more than 5 years. It has few enemies because there are few larger owls that occur in its habitat. It avoids harassment from smaller birds by roosting in cavities during the day. There is some competition with nesting woodpeckers over cavities.



In Arizona, males begin calling in April. On moonlit nights calling occurs continuously all night. Males attract females to potential nest sites by calling from a cavity, then flying out while singing, as she approaches. Pair bonding occurs when the female accepts food from the male. The female selects the nest cavity and begins to roost in it prior to laying eggs to prevent occupation by other hole-nesting birds. Copulation occurs in the nest tree, and is usually preceded by courtship feeding. Unlike other owls, the female hunts (at dusk) while she is incubating eggs, but depends on the male for food after young hatch.

When danger approaches, the Elf Owl straightens its body, covers its lighter underparts with one wing, then turns its head and peers over the bent wing with the top of its eyes. Unlike the pygmy-owls, it is not very aggressive, preferring to fly away than fight. It occasionally tangles with Whiskered Screech-Owls when establishing territories.

### Adaptations

The Elf Owl uses its camouflaged plumage and roosts in dense shrubbery or in cavities to avoid detection during the day.

Its flight is not entirely silent, but is quieter than the pygmy-owls. It does not need silent flight because its insect prey are little affected by the noise produced by wingbeats.

### HABITAT

The Elf Owl inhabits arid deserts overgrown with saguaro cacti, thorn scrub, and mesquite or deciduous riparian woodlands and adjacent tablelands from 2,000 to 7,200 feet (600 to 2,200 meters) elevation. It is most abundant in deserts dominated by giant saguaro but is found in most woody habitats in its range except for pure stands of pine. It occurs in ravines, canyons, plateaus, and on mountain slopes. During the breeding season it is entirely dependent on woodpecker cavities for nest sites, both in cacti and deciduous trees. In Texas, it often nests in cavities in the stalk of the Agave flower. It roosts in woodpecker cavities and dense foliage of trees and shrubs.

### VOICE

The Elf Owl has a dozen distinct vocalizations. The primary advertising song of the male is a high-pitched yip, "whi-whi-whi-whi-whi" that resembles a puppy's yelp. Five to 15 notes are given during each sequence and calling can be almost continuous through the night. Singing is most intense during early evening and near dawn, on moonlit spring nights. A shorter version of this song attracts females to potential nest cavities. Duets between mated pairs occur, but the female's song is softer and shorter.

The female emits a short "peeu" note to help the male locate her. The male can give a short flight song "CHU-ur-ur-ur", when he leaves a cavity that he has been "showing" to his mate. When disturbed both sexes give a sharp "cheeur". As the male flies to the female prior to copulation he gives a repeated "che-o". During copulation the female gives a shrill "sheee". Nestlings give a repetitive rasping call when hungry.

### PELLETS

Pellets are tiny, dry and loosely formed. They contain mainly insect body parts and tend to disintegrate soon after ejection.

### FOODS

Virtually all prey is arthropods, mainly insects and scorpions. There are only 2 records of small lizards and 1 record of a small snake being taken, although they likely take the odd mouse or small bird too. Food taken probably reflect local abundance of various prey species. During one study, spiders accounted for one-half of all prey taken. During another study, crickets and moths were primary foods in June, but owls switched mainly to scarab beetles by mid July. Adults remove stingers from scorpions before feeding them to their young. Other foods include grasshoppers, locusts, mantids, fly larvae, caterpillars, centipedes, and cicadas.

## NESTING

The Elf Owl is entirely dependent on woodpeckers for providing nest cavities. Northern Flickers and Gila Woodpeckers in saguaro cacti, and Acorn Woodpeckers in woodlands, provide most of the cavities used for nesting. Cavity entrance ranges from 10 to 33 feet (3 to 10 meters) above ground, averaging about 18 feet (5.5 meters) up. Clutch size ranges from 1 to 5 eggs, averaging 3 eggs. Eggs are laid every second or third day, and incubation commences after the second egg is laid. The incubation period is 21 to 24 days. Nestlings are fed by the female as she passes on food brought to her by the male. During peak hunting periods, the male may bring food to the nest as often as once/minute. Young fledge after 28 to 33 days. Unlike other owls, recently fledged young are able to capture their own prey soon after they leave the nest.

Elf Owls are single-brooded. Breeding success is the highest of any reported for North American owls (70% of all eggs laid result in fledged young). This high rate of success is due to the difficulty that mammalian predators have in reaching nests, especially those in cacti.

## CONSERVATION

Populations may be stable overall, but are decreasing in southwestern California and Arizona and increasing in New Mexico and Texas. In prime habitats, they are a relatively abundant bird, an unusual status for owls which are generally thinly distributed. Because they are so closely tied to woodpecker cavities for nesting, land management policies that provide for good woodpecker habitat will aid Elf Owls.

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# Eastern Screech-Owl

*Otus asia*

## General Description

The Eastern Screech-Owl is a small, nocturnal, woodland owl of eastern North America and is one of our more common owls. It is the smallest eastern owl next to the Northern Pygmy-Owl and is the smallest eared owl found east of the Rocky Mountains. It is a squat-looking owl that sits erect, its plumage fluffed out, with feet and legs obscured, and its distinct ear tufts raised. The iris is bright yellow and this owl will swivel its head into contorted positions to gain a good view because its eyes are immovable. Its bill is gray-green, with tufts of bristly feathers around its base, and toes are yellow. Its plumage is either mainly grayish or reddish-brown (see Morphs) variegated dark and light, that resembles a furrowed tree bark pattern. Its facial disk is bordered by black.

## Size

The Eastern Screech-Owl is the 12th largest North American owl overall. Because of its puffed plumage it gives the impression of being larger than it is. Females are 5 to 10% larger than males. Females average 9.2 inches (23 centimeters) and males average 8.2 inches (21 centimeters) in length, respectively. Wingspans average 22 inches (56 centimeters) for females and 21 inches (54 centimeters) for males. Weights average 7.3 ounces (208 grams) for females and 7.0 ounces (200 grams) for males.

## Morphs

There are two color morphs, a gray phase and a reddish-brown phase.

## Specific Description

### Adult (gray phase)

- refer to above
- facial disks dusky white with fine gray-brown mottling
- overall gray-brown, with gray narrow vertical stripes, bars, and spots on underparts, and barred wings and tail
- legs light cinnamon buff

### Adult (red phase)

- refer to above
- similar pattern to gray phase except cinnamon instead of gray
- face plain light cinnamon
- whitish superciliary and loreal plumage

### Juvenile (gray phase)

- similar to adults but indistinct stripes and bars more patterned
- many feathers tipped with white

### Juvenile (red phase)

- grayish brown, but distinctly rufescent color overall
- bars and stripes less distinct than adults

## Similar Species

The Eastern Screech-Owl is only likely to be confused with the Western Screech-Owl.

These owls can only be distinguished by their different calls, but only occur together locally in eastern Colorado and southern Texas.

#### Other Names

It has also been known as Ghost Owl, Dusk Owl, Little-eared Owl, Mouse Owl, Shivering Owl, Spirit Owl, Little Dukelet, Texas Screech-Owl, and Red Owl.

#### Etymology

The scientific name *Otus asio* translates into "eared owl" or "horned owl".

#### Mythology

Cherokee shamans valued Eastern Screech-Owls as consultants as the owls could bring on sickness as punishment. Oto-Missouris thought that if you heard a screech-owl call, then death is going to occur. Louisiana Cajuns thought you should get up from bed and turn your left shoe upside down to avert disaster, if you heard one calling late at night.

#### RANGE

North America - Resident from extreme southeastern Alberta, southern Saskatchewan, southern Manitoba, northern Minnesota, northern Michigan, southern Ontario, southwestern Quebec, and Maine south through the eastern United States, northeastern Montana, eastern Wyoming, northeastern Colorado, Kansas, western Oklahoma, and west-central Texas. May breed in central Alberta.

Subspecies -There are 9 recognized subspecies of this owl of which 5 occur in North America.

*Otus asio asio* - occurs in Minnesota, peninsular Michigan, southern Quebec, and southern Maine south to Missouri and northern parts of Mississippi, Alabama, and Georgia.

*Otus asio floridanus* - occurs in Florida and west along the Gulf Coast to Louisiana and north to Arkansas.

*Otus asio hasbroucki* - occurs from central Kansas to Oklahoma and Texas.

*Otus asio maxwelliae* - occurs from southeastern Alberta, southern Saskatchewan, southern Manitoba, eastern Montana, and the Dakotas south to eastern Montana, western Nebraska, western Kansas, and northeastern Colorado.

*Otus asio mccallii* - occurs locally only in the Lower Rio Grande of Texas.

The Eastern Screech-Owl also occurs in Mexico.

#### BEHAVIOR

During direct flight, the Eastern Screech-Owl flies fairly rapidly with a steady wingbeat, about 5 strokes/second. It rarely glides or hovers, but may fly bat-like with erratic movements, when maneuvering through wooded areas. Wings are broad and the head is held tucked in giving a flying bird a stubby appearance.

It hunts at night, from dusk to dawn, but most hunting is done during the first four hours of darkness. It searches for prey mainly while in flight, rather from a perch. When prey are spotted, the owl dives quickly and seizes it in its talons. It also captures flying insects on the wing. Small prey is usually swallowed whole on the spot. Larger prey is carried in the bill to a perch and then torn apart. This owl tends to frequent areas in its home range where it hunted successfully on previous nights. It is an opportunistic hunter and will switch to

almost any suitably-sized prey when abundant. It has even been observed fishing at holes in lake ice left by ice fishers or at open pockets of water.

The Eastern Screech-Owl is essentially non-migratory except when severe food shortages or severe winters force some populations to move southward. Adults tend to remain near their breeding areas year-round while juveniles disperse in the autumn. Siblings tend to disperse together.

Small territories around nest sites are vigorously defended by males, but pairs may nest within 164 feet (50 meters). Breeding territories range from 10 to 15 acres (4 to 6 hectares) in wooded suburban areas to 75 acres (30 hectares) in more open rural areas. Home ranges are much larger, up to 200 acres (80 hectares), but these are not defended and there is much overlap between pairs.

Captive owls have lived over 20 years, but wild birds would be unlikely to reach this age. Juvenile and adult mortality may reach as high as 70% and 30% respectively. Predators of this owl include Great Horned Owls, Barred Owls, Long-eared Owls, Great Gray Owls, Short-eared Owls, Snowy Owls, mink, weasels, raccoons, skunks, snakes, crows, and Blue Jays. Cannibalism by other screech-owls also occurs. Eastern Screech-Owls are the second most frequently killed bird by moving vehicles, after American Robins.

Courtship behavior is elaborate. Males approach females, calling from different branches until they are close. The male then bobs and swivels head, bobs entire body, and even slowly winks one eye at the female. If she ignores him, bobbing and swiveling motions intensify. If she accepts him, she moves close and they touch bills and preen each other.

#### Adaptations

Uses variegated plumage as camouflage. When threatened, it stretches body and tightens feathers in order to look like a branch stub to avoid detection, but will take flight when it knows it has been detected. In open roosts, gray-phase birds tend to roost next to a tree trunk, whereas red-phase birds tend to roost in outer foliage, possibly because of thermal requirements.

Like all owls, it has exceptional hearing, that aids in nocturnal hunting.

It preens often and readily uses bird baths, but nests are often filled with pellets, prey remains, etc.

The Eastern Screech-Owl can be very aggressive and will attack larger owls, other birds, or mammals when protecting nests or defending itself. It can be very tame when handled by humans.

#### HABITAT

The Eastern Screech-Owl inhabits open mixed woodlands, deciduous forests, parklands, wooded suburban areas, riparian woods along streams and wetlands (especially in drier areas), mature orchards, and woodlands near marshes, meadows, and fields. It avoids dense forests because Great Horned Owls use that habitat, and high elevation forests. It hunts mainly in open woodlands, along the edges of open fields or wetlands, or makes short forays into open fields.

It roosts mainly in natural cavities in large trees, including cavities open to the sky during dry weather. In suburban and rural areas it may roost behind loose boards on buildings, boxcars, or water tanks. It will also roost in dense foliage of trees, usually on a

branch next to the trunk, or in dense scrubby brush.

## VOICE

Males have a lower-pitched voice than females. The male's most common call is an eerie, mellow, muted trill "hoo-hoo-hoo....", or bouncing song, that rises in pitch, before sliding down again. This call is given by the male during the mating and nesting seasons, each call lasting 2 to 3 seconds with about 35 notes given, and repeated at various intervals. This call is primarily territorial in nature and announces ownership of nest cavities. When young are in the nest, adults give a descending whinny call, rather than the bouncing call. This call is given through the winter until the mating call begins again. Females tend to bark or hoot when defending broods. Young "peep" for food during their first three weeks, then chatter or hum later. Fledglings demand food by a harsh "keeeerr-r-r-r". It does not call while in flight, except when alarmed.

## PELLETS

Pellets are medium-sized, averaging about 1.5 by 0.75 inches (3.8 by 1.9 centimeters). Pellets are compact, dark gray, ovals that are composed of fur, feathers, bones, teeth, and chitin. Two to 4 pellets are cast each day.

## FOODS

An extremely wide range of prey species is captured. Its most favored prey is small microtine rodents and deer mice. Other mammals taken include wood and Norway rats, chipmunks, cotton rats, squirrels, shrews, bats, and moles. Large flying insects such as beetles, katydids, grasshoppers, locusts, crickets, mantids, roaches, cicadas, moths, horseflies, and dragonflies are readily taken. Birds comprise about 7% of its diet and include many species of small songbirds but also larger birds such as Northern Bobwhite, Rock Dove, Ruffed Grouse, and other screech-owls. Birds may be captured more often during periods of heavy songbird migration. Other prey include small fish, small snakes, lizards, and soft-shelled turtles, small frogs, toads, and salamanders, and invertebrates such as crayfish, snails, spiders, earthworms, scorpions, and centipedes.

## NESTING

The Eastern Screech-Owl nests almost exclusively in tree cavities. Enlarged natural cavities are preferred but it will also use old Pileated Woodpecker and Northern Flicker cavities. Nest cavities are usually 4 to 5 inches (10.2 to 12.7 centimeters) wide and are usually shaded from bright sunlight. Nest cavities are usually 6.5 to 20 feet (2 to 6 meters) above the ground, but may be up to 50 feet (15 meters) up. This owl will readily nest in suitable nest boxes and occasionally behind loose boards on abandoned buildings or barns. Nests are almost always in deciduous trees such as oaks, elms, maples, sycamores, willows, and apples; occasionally in pines.

No nest material is added. Eggs are laid on natural sawdust on floor of cavity. Clutch size ranges from 2 to 8 eggs, averaging 3 to 5 eggs in most areas. The average clutch size increases from south to north and from east to west. Eggs are laid every two days and incubation begins after laying of the first egg. The incubation period is about 26 days and the fledging period about 31 days. Females do most of the incubating but males will assist.

The male provides most of the food while the female broods young, and stockpiles food during early stages. When young are small the female rips up food for them.

Eastern Screech-Owls are single brooded, but may re-nest if first clutches are lost. Pairs

will often reuse nest sites in consecutive years. Pairs mate for life but will accept a new mate if the previous mate disappears. Gray and red color phases will mate together.

## CONSERVATION

The Eastern Screech-Owl is dependent on open deciduous woodlands that have suitable nesting sites (large trees with natural or woodpecker cavities) and sufficient prey densities. Urbanization has caused local declines in heavily developed areas of eastern North America. Removal of riparian forest in drier regions will cause population declines because most habitat is confined to riparian zones. However, this adaptable owl can survive in wooded suburban areas and city parks as long as they are not directly persecuted. Populations likely fluctuate more depending on prey availability.

Nest box programs can enhance local populations, especially in areas short of suitable tree cavities.

The Eastern Screech-Owl feeds mainly on small rodents and flying insects that are considered injurious to agricultural or forestry crops. Its depredation on songbirds is relatively insignificant because birds comprise a very small percentage of its diet.

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# Ferruginous Pygmy-Owl

*Glaucidium brasilianum*

## General Description

The Ferruginous Pygmy-Owl is a rare, tiny, diurnal owl of southwestern deserts and scrubby arid woodlands. It is most active near dawn and dusk, less so during the heat of the day. It is slightly larger than sparrow-sized with grayish-brown, gray, or rufous upperparts and face, and a light belly that is boldly streaked with brown. Its head and nape are heavily marked with thin, dark stripes. On its nape are two distinctive, vertical black patches that resemble an extra pair of eyes. Its relatively long tail is distinctly barred with 7 to 8 light stripes. Its eyes are yellow and have a piercing quality, common to all pygmy-owls. At rest it sits with its tail held straight down, unlike the Northern Pygmy-Owl, and often twitches its tail when excited. In flight it resembles a shrike with rapid wing beats and rounded wing tips. Pygmy-owl heads are relatively small and their feet are relatively large for owls.

## Size

The Ferruginous Pygmy-Owl is the third smallest owl in North America. It is shorter, but marginally larger overall, than the Northern Pygmy-Owl. Females are 5 to 10% larger than males. Lengths average 6.6 inches (17 centimeters) for females and 5.9 inches (15 centimeters) for males. Wingspans average about 15 inches (38 to 39 centimeters) for females and males. Weights average 2.6 ounces (75 grams) for females and 2.2 ounces (61 grams) for males.

## Morphs

There are two color phases. The red phase, with overall rufous-brown plumage, is quite rare and is found mainly in Arizona. A gray phase, with whitish tail bands, is found from Mexico southward. An intermediate grayish-brown form has buffy tail bars and rufous-tinged upperparts, and is found typically in Texas and Arizona.

## Specific Description

### Adult (gray phase)

- refer to above
- 7 to 8 tail bars rather than 6 to 7 of Northern Pygmy-Owl

### Adult (red phase)

- similar patterns as gray phase but overall plumage is cinnamon-brown throat

### Adult (gray-brown intermediate)

- buffy tail bars and cinnamon-tinged upperparts

## Juvenile

- similar to adult pattern but darker and without streaks on head

## Similar Species

The Ferruginous Pygmy-Owl can be easily confused with the Northern Pygmy-Owl from southern Arizona through Central America. It is best separated by its more rufous overall plumage and different primary call (see VOICE). The tiny Elf Owl has a shorter tail, is darker overall, and is nocturnal. In flight, it may resemble a shrike but shrikes have a black facial mask and light gray plumage.



## Other Names

It has also been known as Ferruginous Owl, Cactus Owl, Streaked Pygmy-Owl.

## Etymology

The scientific name *Glaucidium brasilianum* translates into "the little owl from Brazil".

## Mythology

No information on mythology.

## RANGE

North America - Resident in south-central Arizona and extreme southern Texas.

Subspecies - There are 2 recognized subspecies of this owl, of which one is found in North America.

*Glaucidium brasilianum cactorum* - occurs in Arizona and Texas.

The Ferruginous Pygmy-Owl also occurs in Mexico, Central America, and South America.

## BEHAVIOR

The Ferruginous Pygmy-Owl is very secretive and tends to perch and roost in creek side thickets where it is safe from predators. When hunting it likes to perch on the uppermost twigs of trees or on top of saguaro cacti. When perched it often jerks its tail upwards or moves its head erratically. It makes short, rapid, undulating flights between perches, plummeting downwards as it leaves a perch before leveling off, and swooping up to the next. It rarely glides, and hovering is unknown. Its flight is relatively noisy for an owl, but quieter than Northern Pygmy-Owls.

Like all pygmy-owls, the Ferruginous Pygmy-Owl is a fierce bird that will attack prey or drive off intruders several times its own size. It is a "sit and wait" predator, that hunts mainly by vision alone. It dives down onto prey on the ground and drives its talons into the prey's throat and rips at the head with its beak. All prey is carried off in its feet to feeding sites. Birds are usually plucked before being consumed, and the head is often eaten first. It often swallows prey whole, unlike the Northern Pygmy-Owl. This little owl can carry prey weighing 2 to 3 times its own weight.

Ferruginous Pygmy-Owls are nonmigratory and likely highly territorial. They are very unsociable birds, remaining solitary much of the year, except when nesting or caring for fledged young. There is no information on territory size.

There are no data on longevity or mortality. Potential predators of this owl are other owls, jays, crows, ravens, snakes, and weasels. Courtship behavior is thought to be similar to other pygmy-owls.

## Adaptations

Flight feathers are more fluted than the Northern Pygmy-Owl so its flight is a bit quieter.

The Ferruginous Pygmy-Owl avoids predation by most larger owls by being active during the day and roosting in thick cover or tree cavities during the night. It is highly adapted to

daytime living, and has relatively poor nighttime vision. The large, black eyelike spots on its nape, are thought to help ward off surprise attack from the rear, by making it looking larger than it really is.

#### HABITAT

The Ferruginous Pygmy-Owl inhabits arid areas in the United States and Mexico, typically saguaro cactus deserts, riparian woodlands, mesquite thickets, and thorn scrublands. In general, it occurs in lower more arid habitats than the Northern Pygmy-Owl, avoiding high elevations, above 4,000 feet (1,220 meters), or moister coastal forest. From Panama southward it inhabits a narrow niche in tropical forests. It roosts in heavy riparian brush, in heavily foliated deciduous trees, or in old woodpecker cavities. It is dependent on cavities in trees and large cacti for nesting. In desert areas, it roosts and nests mainly in woodpecker cavities in saguaro and cholla cacti.

#### VOICE

The primary call of the male Ferruginous Pygmy-Owl is a series of repetitive, whistled popping hoots "too-too-too-too-too-too", given at a rate of 2.0 to 2.5/sec. Its tail jerks with each toot. Its call is harsher and more rapid than the Northern Pygmy-Owl and these differences are the best way of separating the 2 species. This call is territorial in nature and is usually given near dusk and dawn. It may be heard year round but occurs most frequently in spring. Limited information suggests male and female calls are similar. Other calls are not well-described but include a rolling, repeated "chirrup" whistle and an insect-like rasping note. Juveniles beg for food with a short, harsh, rattle.

#### PELLETS

Pellets are very small and compact, averaging about 1 to 1.2 inches (2.5 to 3 centimeters) long. They are formed only occasionally because this owl does not consume large amounts of fur, feathers, or bone.

#### FOODS

The Ferruginous Pygmy-Owl feeds on a wide range of small prey, probably including all small mammals, birds, and reptiles in its range, although its dietary preferences are not well known. Large insects such as grasshoppers, crickets, and locusts are thought to be its primary prey. It also takes mice, voles, bats, young rabbits, toads, frogs small lizards and snakes, chipmunks, and scorpions. Birds include mainly songbirds, but birds as large as robins and quail are taken.

#### NESTING

The Ferruginous Pygmy-Owl is almost entirely dependent on cavities in live trees, stumps, snags, or cacti for nest sites. These cavities are mainly natural cavities or old woodpecker nests. Occasionally it uses deep depressions on branches and holes in sand banks. Natural cavities are used more frequently than by Northern Pygmy-Owls. Nest trees include pine, mesquite, cypress, and cottonwood. Nest cavities range from 10 to 40 feet (3 to 12 meters) above ground, averaging about 16 feet (5 meters).

Eggs are laid between April and June. Clutch size ranges from 2 to 5 eggs with an average of 3 to 4 eggs. The female likely does all of the incubating and brooding with the male bringing food and defending the nest. The incubation period is probably about 29 to 30 days. Eggs hatch synchronously as in Northern Pygmy-Owls. Young grow quickly, reaching 60% of adult size after 2 weeks. Young from a captive pair fledged at 28 days, when they

were capable of flight. Fledglings are then fed and defended by their parents for a further 20 to 30 days. Family groups tend to break up in late summer or autumn.

Ferruginous Pygmy-Owls are single-brooded. It is not known if replacement clutches are laid. Nest cavities may be used for several consecutive years.

#### CONSERVATION

The range of the Ferruginous Pygmy-Owl in the United States is extremely restricted. In Texas, it is limited to remnant mesquite thickets in two counties. In Arizona, it is limited to riparian strips along creeks and saguaro forests; both of these habitats are being continually lost to human development. The future of this little owl in the United States remains uncertain.

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# Flammulated Owl

*Otus flammeolus*

## General Description

The Flammulated Owl is a tiny woodland owl of western North America and is one of the most sought-after species by bird-watchers. It is a short, squat-looking, sparrow-sized owl that resembles a tiny screech-owl. It has short, sharp ear tufts that are visible only at close range. The eyes are dark brown, giving it a placid look. Its bill is slate black. Its legs are short and heavily feathered with small naked feet. Plumage is variable but mainly light below with broad to fine dark vertical streaks resembling furrowed tree bark. It is variegated dark on back and wings with light spots and bars. Flame-shaped cinnamon marks on scapulars.

## Size

The smallest eared owl, it ranks as the 4th smallest in overall size. Females are slightly larger than males. Females average 6.8 inches (17 centimeters) in length and males average 6.2 inches (16 centimeters) in length. Females weigh about 4.8 ounces (137 grams) and males about 4.4 ounces (126 grams). Its wingspan is about 18 inches (45 centimeters) for both sexes.

## Morphs

There are two color morphs, a gray phase most common in northern parts of its range, and a reddish phase more common in southern parts of its range.

## Specific Description

### Adult (gray phase)

- refer to above
- overall plumage gray and brownish
- V-shaped rufous marks on scapulars
- grayish facial disk with rufous fringe around disk and eye
- cinnamon throat

### Adult (red phase)

- refer to above
- upperparts generally cinnamon brown
- entire face cinnamon except white eyebrows

### Juvenile (both phases)

- similar to adults but colors less intense and upperparts more barred with gray

## Similar Species

The Flammulated Owl is only likely to be confused with the Western or Whiskered Screech-Owl. These owls have similar variegated plumage patterns but are much larger and have a yellow, rather than brown iris.

## Other Names

It has also been known as Flammulated Screech-Owl, Dwarf Owl, Flammulated Scops Owl, Little Owl, Little Flame-colored Owl.

## Etymology

The scientific name *Otus flammeolus* translates into "flaming eared owl".

## Mythology

Hopi people felt that Flammulated Owls taught their ancestors that silence would lead to a successful hunt. In western Mexico, it was thought to travel between the worlds of the living and dead as a messenger from the "land of the dead".

## RANGE

North America - Breeds locally from south-central British Columbia, north-central Washington, eastern Oregon, east-central Idaho, western Montana, and northern Colorado south to southern California, southern Arizona, southern New Mexico, and western Texas.

Subspecies - There are no recognized races.

The Flammulated Owl also occurs in Mexico and Central America.

## BEHAVIOR

Flight is rapid and jerky when flying direct, but hovers briefly when checking on prey. It tends to sit erect with tail pointing downwards. The Flammulated Owl is a "sit and wait" predator. It prefers to perch in upper tree branches while hunting, then glides down to capture prey on ground in a sweeping curve. It also captures prey from tree crowns, trunks and branches, in shrubs, and by hawking flying insects.

Northern populations are migratory while those in central North America are resident. Southern United States populations may move downslope for the winter but there are only isolated winter records from the southern United States.

Males return to breeding territories before females and almost always reoccupy territories used the previous year. Some pairs reunite for 2 or 3 consecutive years. Breeding territories are smaller than larger owl species, because less habitat is required to provide food, nest sites, and roosting sites. Breeding territories are usually less than 900 feet (275 meters) in diameter, while home ranges may be 21 to 60 acres (8.5 to 24 hectares).

As a very small owl, which is vulnerable to predation from other owls and hawks, it is very secretive. Great Horned Owls, Long-eared Owls, and Sharp-shinned Hawks are known predators. It is curious and non-aggressive towards humans except when nesting when it may attack observers.

## Adaptations

The Flammulated Owl is a nocturnal owl that hunts during dusk and at night. It flies occasionally during the day, but does not hunt during daylight hours. It has a very acute sense of hearing and sight in the dark which allows it to capture prey at night. It occurs in a very narrow ecological niche and has limited adaptability.

The Flammulated Owl has extremely well-camouflaged plumage that is its primary defense against predators. During the day it roosts in cavities or behind dense branches. When perched on a branch against a tree trunk, it appears to be part of the tree. It also roosts in dense vegetation to provide some thermoregulation protection against hot sun or cold winds. Recently fledged young are unusually quiet, which helps them avoid predation.

This tiny owl has an unusually low-pitched call, which contrasts with the general trend of smaller owls and higher-pitched calls. This is caused by unusually thickened vibratory membranes in its syrinx and a swelling throat chamber.

#### HABITAT

This species inhabits mainly warm and dry mixed montane coniferous forests. These forests contain mainly pines such as ponderosa pine, Douglas-fir, true firs, and spruces. It prefers forests with a relatively open canopy and a selection of old snags for nesting; and grassy openings for foraging. It avoids dense forests, very high elevation forests, and second-growth forests. It also frequents mixed conifer and trembling aspen forests. It uses more forest types and occupies a greater altitudinal range in the United States than in Canada. Roosts in tree cavities or on branches of well-vegetated trees, often against the trunk.

#### VOICE

It is usually silent except during the breeding season. The primary calls of the male are a low-pitched mellow hoot ("hoop") emitted once every 2 to 5 seconds or a courtship "hoo-Hoop". Females emit a high raspy meow when begging for food from the male. During courtship males and females produce clucks and screeches. Near the nest, adults emit two-syllable mewing calls. Young in the nest are very vocal, producing raspy buzzes while begging for food.

#### PELLETS

Like all owls, it produces pellets of undigested prey material. Pellets are small and loosely formed, and contain insect parts. No other data available on shape, color etc.

#### FOODS

The Flammulated Owl is almost exclusively insectivorous and rarely captures vertebrate prey. It tends to forage on insects that occur in forest openings or along forest/grassland edges. In a study of foods from throughout its range moths, beetles, and grasshoppers were major foods with other flying insects, spiders, scorpions, millipedes, and centipedes also taken. In one Oregon study, all prey items were arthropods with 72% being orthopterans, most being grassland species. In another Oregon study, remains of one vole and one songbird were found.

#### NESTING

The Flammulated Owl is entirely dependent on pre-existing cavities in large decayed or dead trees for nest sites. Most nests have been found in old Northern Flicker cavities. Pileated Woodpecker and rotted-out natural cavities are also used. Nest trees include aspens, pines, and Douglas-firs. Nest-holes range from 10 to 40 feet (3 to 12 meters) above the ground. This owl nests relatively late compared to other owls with eggs being laid from mid April in the south to June in the north. Clutch size ranges from 2 to 4 eggs, with an average of 3 eggs. About 21 to 22 days incubation are required before eggs hatch. Females do all incubating of eggs and brooding of young. During the nesting season males deliver food to the female on the nest. Adults tend to divide broods after they leave the nest, a unique behavior in owls. Young remain near the nest for a few weeks before dispersing to other areas. Although this owl often returns to its previous year's nesting territory, different nesting cavities are usually used.

## CONSERVATION

Throughout its range populations are likely underestimated because of the secretive nature of this little owl. Thus, management concerns based on lack of data may be misplaced in many areas.

However, Flammulated Owls inhabit forests that have high commercial value and are threatened in the long term by harvesting of these forests. Because their breeding habitat requirements are relatively specific and they depend on woodpecker cavities for nest sites, the elimination of live trees and snags suitable for larger woodpecker species, by timber harvest, silviculture, or firewood collecting, will reduce nest-site availability. Because of their small territories, large scale clearcut logging in prime habitats will eliminate significant numbers of owls. Setting aside forest reserves and careful selective logging will help conserve populations.

This owl will use nest boxes as nesting sites. Nest box programs may help maintain populations in areas with limited numbers of natural nest sites.

Little is known of its migratory or wintering ecology. Since it winters almost exclusively in Mexico and Central America, rapid habitat loss in that region is a major concern.

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# Great Gray Owl

*Strix nebulosa*

## General Description

The Great Gray Owl is a large, nocturnal and diurnal, woodland owl of the northern boreal forests. It is the largest "earless" owl in the world. When perched it appears very bulky because of its dense, fluffy plumage, long wings extending past the body, a relatively long tail, and a large head. Its plumage is dark gray overall interspersed with bars and flecks of light gray and white. Its bright yellow eyes seem small set in the prominent facial disks. The disks appear to form one larger disk, giving the face a circular look. It has a noticeable white "mustache" strip under the facial disks, broken by a black "bow-tie". Its feet are heavily feathered and remain hidden from view. In flight it has very long wings and tail.

## Size

The Great Gray Owl is the third largest owl in North America. It is longer than other owls, which makes it appear larger than it is. Females are slightly larger than males. Lengths average 28 inches (72 centimeters) for females and 27 inches (69 centimeters) for males. Wingspans average 56 inches (142 centimeters) for females and 55 inches (140 centimeters) for males. Weights average 3.06 pounds (1,390 grams) for females and 2.84 pounds (1,290 grams) for males.

## Morphs

Great Gray Owls are monotypic, with little geographic or individual variation in plumage.

## Specific Description

### Adult

- refer to above
- very large dark gray plumage, earless, long wings and tail
- white mustache

### Juvenile

- similar to adults but browner

## Similar Species

Barred and Spotted owls appear similar but are smaller and have dark brown eyes. Great Horned Owls have prominent ear tufts and are much stouter looking.

## Other Names

It has also been known as Great Gray Ghost, Cinerous Owl, Spectral Owl, Lapland Owl, Spruce Owl, Bearded Owl, Sooty Owl, and N hi-t hi (Northern Indian: "The Heavy Walker")

## Etymology

The scientific name *Strix nebulosa* translates into "screech owl with gray mottled or cloudy plumage".

## Mythology

No information available.

## RANGE

North America - Breeds to the tree line from central Alaska, northern Yukon, northwestern and central Mackenzie, northern Ontario, south through southern Yukon and interior British Columbia, north and central Alberta, Manitoba, and central Ontario, southwestern Quebec, south locally in the Cascades and Sierra Nevada mountains to east-central California, west-central Nevada, and northwest Wyoming.

Winters generally through the breeding range but wanders south irregularly to southern Montana, North Dakota, southern Minnesota, southern Ontario, and central New York. Has also been found occasionally in Idaho, Nebraska, Iowa, Indiana, Ohio, Pennsylvania, and New Jersey.

Subspecies - There is one recognized subspecies of this owl in North America.  
*Strix nebulosa nebulosa* - occurs only in North America.

The Great Gray Owl also occurs widely in northern Eurasia.

## BEHAVIOR

The Great Gray Owl is a ponderous flier, rarely moving more than short distances between perches. It flies close to the ground, usually less than 20 feet (6.1 meters) up, except when flying to its nest. It seldom glides.

The Great Gray Owl hunts mainly during early morning and late afternoon, especially during winter, but also during other daylight hours and at night. It is often seen perched on poles or fenceposts along roads. When hunting it "sits and waits" on a perch or hunts through the forest a few feet above the ground. When snow covers the ground, the Great Gray Owl hunts by hearing alone and routinely plunges into the snow to capture a small rodent moving underneath. It can reach prey by crashing through snow as deep as 12 inches (30 centimeters). The Great Gray Owl feeds mainly on small rodents and swallow them on the spot. Larger prey is ripped apart, then eaten or carried off.

The Great Gray Owl is a nomadic bird that periodically has irruptive movements southward from northern breeding areas. These movements are most pronounced in central and northern North America, with most of the birds being juveniles. Juveniles can disperse more than 450 miles (700 kilometers) from their natal areas. In some years at least, adults tend to remain near their nesting sites.

Nesting territories are defended from other Great Gray Owls, but foraging areas are widely overlapping. This leads to higher than expected densities, for a large bird of prey; in areas of good habitat 5 pairs/1.1 square miles (290 hectares). Breeding season home ranges averaged about 640 acres (260 hectares) in the Grand Tetons.

This is a long-lived owl with captive owls living to 40 years of age. Mortality in the wild is thought to be linked mainly to starvation or depredation of juveniles by Great Horned Owls, marten, and wolverines. Mortality caused by humans includes shooting, collision with vehicle, and electrocution. Of 193 Great Grays found dead in Manitoba, 157 were killed by collision with vehicles, 26 had been shot, and 10 were dead of unknown causes.

The Great Gray Owl is a semi-nomadic owl, with irregular site or mate fidelity between years. It tends to settle and nest in areas with high food resources and this may lead it to occupy the same nest for several years or move off to new areas. Courtship feeding and

mutual preening between mates begins in midwinter and are critical in forming and maintaining pair bonds. The male typically approaches the female, holding food in its beak. Food is passed with both birds closing their eyes. The male selects possible nest sites and attract its mate with calls. Several sites are inspected before she chooses the nest site.

When threatened, it snaps its beak, spreads its wings, and growls. Males and females aggressively defend nests and have been known to drive off predators as large as black bears.

### Adaptations

The Great Gray Owl thermoregulates by roosting in dense cover. When hot it pants and droops its wings to expose an unfeathered area (apterid) under the wing. Its fluffy plumage and fluted flight feathers allow it to fly silently. Its nomadic nature allows it to take advantage of locally abundant food supplies.

### HABITAT

The Great Gray Owl inhabits a range of forested habitats. In the far north it frequents stunted coniferous forests along the edge of the Arctic treeline, through spruce and tamarack muskeg forests further south. In the Sierra Nevada Mountains it breeds in mixed conifer and red fir forests from 3,000 to 8,900 feet (900 to 2,700 meters) elevation. Nesting habitat usually includes copses or islands of aspens within pure stands of conifers. Most foraging is done in open areas such as swamps, bogs, and forest clearings where there are scattered trees and shrubs to be used as perches. During migration it can be found in estuaries, mountain meadows, and along farm fields where it hunts the edge habitat. In winter it tends to remain along the edges of forests and meadows.

### VOICE

The Great Gray Owl has a distinctive primary call which is a very soft, low-pitched hoot "whooo-ooo-ooo-ooo" with the notes emitted slowly over a 6 to 8 second period. Calls are repeated every 15 to 30 seconds. This call is used as a territorial declaration and can be heard up to 800 m away under good conditions. Territorial calling begins after dusk, peaks before midnight, then peaks again later. Males and females also give a single hoot when near the nest. Females give an excited "ooo-uh" when the male arrives with food. When excited near the nest adults growl, shriek, hoot, wail, and snap their bills.

### PELLETS

Pellets are very large, about 3 to 4 inches (7.6 to 10.2 centimeters) long and 1 to 2 inches (2.5 to 5.1 centimeters) thick. They are dark grayish-black, compact, with numerous bones, skulls, and teeth, and are held together by fur, feathers, and mucus. Pellets are ejected regularly.

### FOODS

Although this a very large owl, most prey are relatively small. Small rodents are their primary prey (80 to 90% of diet) with voles being the most important food in Alaska, Canada, and Oregon. Pocket gophers are the most important food in California. Other mammals taken include rats, mice, shrews, squirrels, rabbits, chipmunks, moles, and weasels. Birds are rarely captured, amounting to only 1 to 2% of their diet. Birds taken include crows, small hawks, American Robin, ducks and grouse. Frogs, toads, snakes, and insects are taken very infrequently.

## NESTING

The Great Gray Owl nests primarily in stick nests made by hawks, ravens, or crows, in the hollowed out top of large-diameter snags, or on the top of clumps of mistletoe. Northern Goshawks are likely the most important provider of nest sites for Great Gray Owls. This owl readily takes to artificial platforms or nests placed in suitable habitat. Nests are usually in a forest, but with a large clearing or meadow located within 0.81 miles (1.3 kilometers).

Nests are usually tidied up and refurbished before use, unlike most other owls. Nest linings include conifer needles, deer hair, moss, and shredded bark. Clutch size ranges between 2 to 5 eggs with an average of 3 eggs. Eggs are laid every 1 to 2 days and incubation commences with the first egg laid. The incubation period is 28 to 29 days. The female does all incubation and the male provides all food to the female and young. The female tears food into small pieces and feeds the young. Young leave the nest at 3 to 4 weeks and can climb well. Fledging occurs after about 8 weeks and young remain near the nest for several months, with the female caring for them. Ravens and Great Horned Owls prey on eggs and nestlings.

It is single-brooded but will readily lay replacement clutches if the first clutch or brood is lost. In Oregon, replacement clutches were laid 15 to 30 days after the first was lost.

## CONSERVATION

The Great Gray Owl readily nests on artificial platforms which has been an important tool used while studying the breeding biology of this species.

This owl is one of the most sought-after birds with birders in North America. Populations are likely stable overall and little management effort is required. Selective logging or small-scale clearcutting can open up continuous forest and enhance habitat for this owl. In the western United States, poisoning of pocket gophers may reduce favored prey abundance.

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# Great Horned Owl

*Bubo virginianus*

## General Description

The Great Horned Owl is a very large, nocturnal, woodland owl that has the widest distribution of any owl in North America. It is our largest eared owl, with 2 inch (5.1 centimeters) long ear tufts and prominent facial markings. It sits erect, with ear tufts slanted outwards, and has a regal appearance. Its plumage is tight, but it still looks heavy. In flight, its wings are long and broad, narrowing at the tips, and it flies quickly with powerful wing strokes. It has the largest eyes of any North American owl and has a yellow iris. Its tail and flight feathers are strongly barred. Its plumage is brownish or grayish-brown overall, with buffy facial discs, often white throat, and profuse thin transverse bars on flanks, sides, and belly.

## Size

The Great Horned Owl is the second largest North American owl, after only the Snowy Owl. Females are 10 to 20% larger than males. Lengths average 24 inches (60 centimeters) for females and 20 inches (51 centimeters) for males. Wingspans average 56 inches (143 centimeters) for females and 53 inches (134 centimeters) for males. Weights average 3.5 pounds (1,597 grams) for females and 3.2 pounds (1,449 grams) for males.

## Morphs

The Great Horned Owl exhibits a wide range of plumage color variation. Ground colors range from very pale gray in Arctic populations to dark brown on the Pacific coast, but there is much individual plumage variation.

## Specific Description

### Adult

- refer to above
- white eyebrows and white throat often white extending down chest
- very large, bulky owl with prominent ear tufts
- all feathers light at base

### Juvenile

- similar to adults but more indistinct stripes
- overall plumage a ruddier orange brown
- white down persists around neck and underparts until first molt

## Similar Species

The Great Horned Owl could be confused with some other large owls. However, Barred and Spotted owls do not have ear tufts and their eyes are brown. The Great Gray Owl is nearly as large but has wide facial disks and no ear tufts. The Long-eared Owl has a similar overall plumage pattern, yellow eyes, and ear tufts, but it is much smaller and thin-looking, rather than heavyset like the Great Horned.

## Other Names

It has also been known as Big Cat Owl, Flying Tiger, Eagle Owl, Big Boot Owl, Big-eared Owl, Hoot Owl, King Owl, and Le Grand-Duc.

## Etymology

The scientific name *Bubo virginianus* translates into "eagle owl from the states of Virginia". This owl was first described by ornithologists in Virginia.

## Mythology

California Newuks believed that after death, the brave and virtuous became Great Horned Owls. In the Sierras, native peoples felt this owl captured the souls of the dead and carried them to the underworld.

## RANGE

North America - Breeds from western and central Alaska, central Yukon, northwestern and southern Mackenzie, southern Keewatin, northern Manitoba, northern Ontario, northern Quebec, Labrador, and Newfoundland south throughout the United States. It does not occur on the Queen Charlotte Islands off the north coast of British Columbia. Winters generally throughout the breeding range, with the northernmost populations being partially migratory, wintering south to southern Canada and the northern United States.

Subspecies - There are 12 recognized subspecies of this owl, 10 of which occur in North America.

*Bubo virginianus algistus* - occurs in western Alaska.

*Bubo virginianus heterocnemis* - occurs in northern Quebec, Labrador, and on Newfoundland.

*Bubo virginianus lagophonus* - occurs in the interior of Alaska and Yukon south through Oregon to north-central California and northwestern Montana.

*Bubo virginianus occidentalis* - occurs from southern Alberta, Saskatchewan and Manitoba east to Isle Royale, and south to northeastern California and central Kansas.

*Bubo virginianus pacificus* - occurs from north-central California to extreme southern California.

*Bubo virginianus pallescens* - occurs in the interior from southeastern California east to north-central Texas and southward.

*Bubo virginianus saturatus* - occurs along the coast from southeastern Alaska south to the coast of northern California.

*Bubo virginianus scalariventris* - occurs in eastern Manitoba and northern and western Ontario.

*Bubo virginianus subarcticus* - occurs from southeastern Yukon, eastern British Columbia and Mackenzie Valley east to western Manitoba.

*Bubo virginianus virginianus* - occurs from Minnesota east to Nova Scotia and south to eastern Texas and Florida.

The Great Horned Owl also occurs in Mexico, Central America, and South America.

## BEHAVIOR

The Great Horned Owl is an extremely powerful flier with methodical wing beats. When attacking prey its strokes are quickened. It flies mainly just above treetops, but also weaves through forest or even soars to thousands of feet like a Buteo hawk.

It begins to hunt just before dark and leaves the protection of dense forests for more open hunting areas. It hunts by perching on snags and poles and watching for prey, or by gliding slowly above the ground. When prey is spotted it attacks ferociously and may take

prey 2 to 3 times heavier than itself. From high perches it dives down to the ground with wings folded, before snatching prey. Prey are usually killed instantly when grasped by its large talons. It also hunts by walking on the ground to capture small prey or wading into water to snatch frogs and fish. It has been known to walk into chicken coops to take domestic fowl. Rodents and small rabbits can be swallowed whole while larger prey are carried off and ripped apart at feeding perches or at the nest. Birds are often plucked first, and legs and wing tips discarded. During times of plenty, it may eat only part of each prey.

The Great Horned Owl is essentially non-migratory except when severe food shortages or severe winters force some populations to move southward. Adults tend to remain near their breeding areas year-round while juveniles disperse widely, over 150 miles (250 kilometers) in the autumn. Territories are maintained by the same pair for as many as 8 consecutive years. However, this owl is solitary in nature, only staying with its mate during the nesting season. Average home ranges in various studies have been shown to be approximately 1 square mile (2.5 square kilometers).

This is a long-lived owl with wild owls of 13 years and captive owls of 29 to 38 years being known. Mortality in the wild is thought to be about 30% annually for adult birds and about 60% for juveniles. Most mortality is directly or indirectly related to man. In one study, of 301 banded birds found dead, 69 were found dead of unknown causes, 62 had been shot, 44 had been trapped, 59 were hit by vehicles on roads, and 20 had been electrocuted. It has almost no natural enemies, except other Great Horned Owls and, occasionally, Northern Goshawks during disputes over nest sites.

The Great Horned Owl nests very early in the year, with calling beginning in early winter. During courtship both sexes hoot. When close they bow to each other, with drooped wings, before copulating. Mutual bill rubbing and preening also occurs. This owl is extremely aggressive when defending its nest and will continue to attack until the intruder is killed or driven off. Humans have been seriously injured at the nest by attacking owls, and hard-hats and face masks are standard equipment for Great Horned Owl biologists.

### Adaptations

All primaries are deeply fluted which aid in silent flight, a remarkable adaptation for such a large bird.

It can control expansion and contraction of pupils individually. It has excellent hearing as its large ear cavities are even more asymmetrically located than in the Barn Owl. Its ear coverts are moveable which aid in sound detection. It also has good diurnal vision.

The Great Horned Owl is very adaptable in habitat and prey utilization, which has allowed its very wide distribution. It is a bird often associated with wilderness but it can thrive in larger, wooded parks and wooded suburbs, because of its highly secretive nature.

### HABITAT

The Great Horned Owl frequents virtually all forested regions from ocean shores to treeline. It also frequents brushy hillsides, cliff faces, abandoned orchards, swamps, second-growth forests, and cities where it may perch on buildings. In grassland areas it nests and roosts in riparian forest along streams or in gulleys. It tends to seek high perches near open areas to search for prey, and prefers to hunt along the edges of forests and clearings. It roosts during the day mainly in dense conifers, on a branch near the trunk.

### VOICE



The Great Horned Owl has a large repertoire of sounds, ranging from deep booming hoots to shrill shrieks. The male's resonant territorial call "hoo-hoo hooooo hoo-hoo" can be heard over several miles during a still night. Both sexes hoot, but males have a lower-pitched voice than females. It gives a growling "krrooo-oo" or screaming note when attacking intruders. Other sounds include a "whaaa whaaaaaa-a-a-aarrk" from disturbed birds, a catlike "MEEE-OWww", barks, hair-raising shrieks, coos, and beak snapping. Some calls are ventriloquial. Most calling occurs from dusk to about midnight and then again just before dawn.

## PELLETS

Pellets are very large, about 3 to 4 inches (7.6 to 10.2 centimeters) long and 1.5 inches (3.8 centimeters) thick. Pellets are dark grayish-black, compact, with numerous bones, skulls, and teeth, and are held together by fur, feathers, and mucus. Skulls as wide as 1.2 inches (3 centimeters) are regurgitated whole. Pellets are regurgitated 6 to 10 hours after eating. Carrion beetles often hasten decomposition of pellets.

## FOODS

An extremely wide range of prey species (at least 253 identified) are captured, but rabbits and hares are its preferred prey. It eats everything from insects and scorpions up to marmots, geese, and herons. Mammalian prey includes all coexisting rodents, squirrels, mink, skunks, raccoons, armadillos, porcupines, domestic cats and dogs, shrews, moles, muskrats, and bats. Bird prey includes all other owls (except Snowy Owl), grouse, woodpeckers, crows, turkeys, ducks, pigeons, Red-tailed Hawks, bitterns, Great Blue Heron, ducks, swans, gulls, etc. Reptiles include snakes, turtles, lizards, and young alligators. Amphibians include frogs, toads, and salamanders. Other foods include fish, large insects, scorpions, centipedes, crayfish, worms, spiders, and road killed animals.

## NESTING

The Great Horned Owl nests primarily in large stick nests in trees and cacti, of other birds such as hawks (mainly Red-tailed Hawk), ravens, and ospreys, but also in rock crevices and caves on cliff faces, and rotted out snag tops. It also may nest in clumps of witches broom, old squirrel nests, in abandoned buildings, or on artificial platforms. Nests are usually in the interior of a forest stand, except for cliff nests which are usually fairly high up or screened by vegetation. Nesting begins very early (February) compared to other owls.

Old nests are not repaired before eggs are laid. Clutch size ranges from 1 to 6 eggs, but averages only 2 to 3 eggs. Timing of nesting can be advanced and numbers of eggs laid increased during years of high food availability. The female does all incubation and the male delivers food to the nest. Each young needs an average of 10 ounces (300 grams) of food/day throughout the nestling period. Young start roaming from the nest onto nearby branches at 6 to 7 weeks, when they are called "branchers", but cannot fly well until 9 to 10 weeks old. They are fed for another few weeks as they are slowly weaned. Families remain loosely associated during summer before young disperse in the autumn.

It is single-brooded but will lay replacement clutches, of fewer eggs, if the first clutch is lost.

## CONSERVATION

The Great Horned Owl suffers high degrees of mortality from humans. They are still routinely shot by farmers and rural-living people, who fear for their poultry and other small

animals. However, it is highly beneficial to man because of the large numbers of rodents it kills. It is also one of the owls most frequently killed by vehicles. Other than man, it has few natural enemies.

Populations are likely stable overall, except in heavily urbanized areas. Populations likely fluctuate more depending on prey availability. Removal of riparian forest in drier regions will cause population declines because most habitat is confined to riparian zones. However, this adaptable owl can survive in wooded suburban areas and city parks because of its highly secretive nature.

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# Northern Hawk Owl

*Surnia ulula*

## General Description

The Northern Hawk Owl is a medium-sized owl that frequents northern boreal forests. It is one of our most diurnal of owls. A reclusive species, it is most often seen perched on a telephone pole or tip of a tree along the edges of fields and roads. It is an "earless" owl with overall grayish and brownish plumage. Its gray facial disks are distinctively bordered on the outside with broad, vertical black "sideburns". Its breast is densely barred with brown horizontal stripes. Its brown wings are heavily spotted with white and have narrow tips. It sits hawk-like, rather than erect like other owls, looking slender, when its relatively long tail is most noticeable. Its tail is usually held at an angle from the body. It has small, piercing eyes with a lemon yellow iris. In flight it flies swiftly, with rapid bursts of wing beats, between perches.

## Size

The Northern Hawk Owl is the ninth largest North American Owl. Females and males are similar in size. Lengths average 17 inches (43 centimeters) for females and 16.5 inches (42 centimeters) for males. Wingspans average 33 inches (84 centimeters) for both females and males. Weights average 9 ounces (252 grams) for females and 8 ounces (225 grams) for males.

## Morphs

The Northern Hawk Owl is monotypic with no apparent geographic or sexual plumage variation.

## Specific Description

### Adult

- refer to above
- black "sideburns" and small yellow eyes
- long tail, often jerked upward when sitting
- sits atop trees during daylight hours
- heavily barred breast and belly

### Juvenile

- similar to adults but less spotting on upperparts

## Similar Species

In flight it could be confused with the Northern Goshawk or Cooper's Hawk, because of its rapid wing beat and relatively long tail. At rest it resembles an American Kestrel, but is larger.

## Other Names

It has also been known as Hawk Owl, Day Owl, and Hudsonian Owl.

## Etymology

The scientific name *Surnia ulula* translates into "bird of ill omen".

## Mythology

No mythology known.

## RANGE

North America - Breeds from the limit of trees in central Alaska, Yukon, northwestern and central Mackenzie, southern Keewatin, northern Manitoba, northern Ontario, northern Quebec, central Labrador, and Newfoundland south to southeastern and south-coastal Alaska, through interior British Columbia, south-central Alberta, central Saskatchewan, southern Manitoba, northern Minnesota, northern Michigan, south-central Ontario, southern Quebec, and northern New Brunswick.

Winters from the breeding range southward irregularly to southern Canada and the northern United States. Occasionally birds have been found in Oregon, Montana, South Dakota, Iowa, Wisconsin, Michigan, Ohio, Pennsylvania, and New Jersey.

Subspecies - There are 2 recognized subspecies of this owl in the world, only one of which is normally found in North America.

*Surnia ulula caparoch* - the race that is resident in North America.

*Surnia ulula ulula* - although this race is resident in Eurasia it has been discovered once in western Alaska.

The Northern Hawk Owl also occurs widely in northern Eurasia.

## BEHAVIOR

The Northern Hawk Owl is a relatively rapid flier for an owl. In flight it resembles a falcon with its rapid and erratic wing beats and little gliding. It tends to fly in straight lines, but is highly maneuverable through the forest. When flying from perch to perch it swoops down low to the ground, skims along a few feet above ground, then swoops up to its next perch. It normally perches on the uppermost spire of live trees, and on stubs, poles, or tall shrubs. This owl roosts at night.

The Northern Hawk Owl hunts during the day, mainly from dawn to about 09:00 AM and after 3:00 PM. It is usually a "sit and wait" predator, and sits high up watching for prey. Occasionally, it flies through open wooded areas searching for prey, and even hovers, a rare behavior in owls. Once prey is spotted this owl swoops down, flies quickly to the prey, and attacks immediately. Small prey are snatched up while still flying. Larger prey are killed then carried back to a feeding perch. This owl can carry prey weighing several times its body weight. It virtually always carries prey in its talons. It eats more slowly than most owls and rarely swallows whole anything larger than a mouse. Larger prey are torn into small pieces before swallowing.

The Northern Hawk Owl is relatively nomadic, with densities of populations depending on abundance of small rodents. During winters of low food abundance, irruptive southward movements out of the boreal forest occur. Most of these birds are immatures. After the breeding season, adult females tend to disperse further from breeding sites than adult males. Immatures disperse from natal areas for several hundred miles. Occasionally, family groups may remain together through late winter. Breeding densities are relatively low, as low as 1 pair/190 square miles (1 pair/500 square kilometers) of good habitat. Home ranges around nests vary from 350 to 2,100 acres (1.4 to 8.5 square kilometers).

Little is known of mortality or longevity in this owl. It is thought to live to at least 10 years. Because it hunts during the day it avoids predation by larger owls.

Breeding territories are established only a few weeks prior to nesting. Males make display flights above their territories, with some wing-clapping and calling. Females respond to calls with similar calls. As pairing takes place, they perform duetted trilling calls and bill-grooming. Males begin courtship feeding of the female and begin to cache food during the copulatory period. Males help choose nest sites by attracting mates to potential nests, but the female chooses the site.

This owl is very tame in the presence of humans, allowing fairly close approach during broad daylight.

### Adaptations

Its plumage is harder than most other owls; therefore its flight is not as silent. It depends mainly on vision for hunting and is adapted for daytime hunting. It has good hearing but cannot pinpoint prey by hearing alone. Its ear cavities are not covered by an operculum. For an owl, it nests in an unusual variety of microhabitats.

### HABITAT

The Northern Hawk Owl frequents open coniferous or mixed deciduous/coniferous forests near more open hunting areas. Swamps, burns, muskegs, and the edges of logged areas with a selection of snags and dead branches to perch on are favored. It breeds from lowland valleys up to near treeline, and north to forest pockets in the Arctic tundra. During nonbreeding seasons, some birds disperse into farming and prairie areas.

It roosts at night in larger trees on a branch close to the trunk.

### VOICE

The Northern Hawk Owl has many vocalizations but it does not hoot. It typically gives a high-pitched trill "tuh-Witta-Witt, tuh-Witta-tuh-Witt, tuh-Witta-Witta-Witta" or "illy-illy-illy-illy". In flight it may give a harsh hawk-like scream "Kweeeee". Breeding birds call to each other with bubbling whistled trills that may last up to 14 seconds. The male calls during display flights and when showing his mate a possible nest site. The female's trill is harsher and shorter. This owl also mews like a kitten when contacting its mate at close range, during copulation, or when courtship feeding. Other yelps, whinnies, and screeches occur when it is excited by intruders. Nestlings begin hissing soon after hatching, then give a high-pitched whistle. Fledglings angrily cackle and hiss when disturbed.

### PELLETS

Pellets are relatively small, gray, and coated with mucus. Little other data is available.

### FOODS

Foods during the breeding season are almost exclusively (90 to 95%) microtine (voles and lemmings) rodents, although local variations in diet occur depending on abundance of small prey. Other mammalian prey include ground squirrels, mice, chipmunks, rabbits, snowshoe hares, shrews, and weasels. After the breeding season, its diet changes markedly as birds become important components. Birds may be 90% of total prey biomass taken during nonbreeding seasons. Birds as large as Ruffed Grouse and ptarmigan are taken, but most are smaller. In Alaska, Gray Jays are frequently taken. Other birds include medium-

sized shorebirds and songbirds. Insects are also taken in summer.

## NESTING

The Northern Hawk Owl nests in a variety of sites including natural tree cavities, enlarged Northern Flicker and Pileated Woodpecker cavities, hollowed out stump tops, and old stick nests of crows and ravens. Nests are usually situated in open forest or near the edge of open and closed forest.

Clutch size ranges from 3 to 9 eggs, with an average of 5 to 7 eggs. Clutch size increases from south to north, and during years of high vole abundance. Eggs are laid every 1 to 2 days and incubation begins with laying of the first egg. The female does all incubating while the male brings food to the nest. The female may strip feathers from her breast and incubate with her bare skin. Incubation takes from 25 to 30 days. Young grow rapidly, 3 times as fast as Boreal Owls. This is due to the young being fed 3 to 4 times as often as other northern forest owls. Food caching behavior of the male and the long periods of daylight available for hunting in northern regions, compared to the darkness available to nocturnal owls, are likely responsible for the rapid feeding of young. Nestlings leave the nest at about three weeks, and fledge one or two weeks later. Young remain near their nest for 2 to 3 months then begin dispersing.

The Northern Hawk Owl is single brooded. During most years fledging success is very high. Males may attract two mates simultaneously, but only one may nest successfully.

## CONSERVATION

The Northern Hawk Owl is generally little affected by man's activities. Because of its lack of fear of man it is fortunate that this owl lives in lightly inhabited boreal forests. There is a limited amount of mortality through shooting and accidental trapping.

Clearcut logging and draining of swamps removes productive habitat from this owl. Protection of this owl's habitat would also protect threatened species such as woodland caribou, cougar, wolverine, marten, and Great Gray Owl.

The Northern Hawk Owl feeds on rodents and insects injurious to agriculture and forests. It is less bothered by fleas and bird lice than most other owls.

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# Northern Pygmy-Owl

*Glaucidium gnoma*

## General Description

The Northern Pygmy-Owl is a tiny, woodland, diurnal owl that is most active between dawn and dusk. It is widespread across western North America. It is slightly larger than sparrow-sized with grayish or brownish upperparts and light belly that is boldly streaked with brown. Its head and nape are liberally sprinkled with whitish dots. On its nape are 2 distinctive, vertical black patches that resemble an extra pair of eyes. Its relatively long tail is distinctly barred with 6 to 7 light stripes. Its eyes are yellow and have a piercing quality similar to the Northern Hawk Owl. At rest it sits with its tail cocked away from vertical, and often twitches its tail when excited. In flight it resembles a shrike with rapid wing beats and rounded wing tips.

## Size

The Northern Pygmy-Owl is the second smallest owl in North America. Only the Elf Owl is smaller. Females are about 10% larger than males. Lengths average 7.3 inches (18.5 centimeters) for females and 6.5 inches (16.5 centimeters) for males. Wingspans average 15 inches (38 centimeters) for females and males. Weights average 1.6 ounces (45 grams) for females and 1.5 ounces (41 grams) for males. The interior subspecies (californicum) birds are heavier, females averaging 2.6 ounces (73 grams) and males averaging 2.2 ounces (62 grams).

## Morphs

There are two color phases, a gray phase typical of northern populations and a red phase that becomes common in southern populations.

## Specific Description

### Adult (gray phase)

-refer to above

-unmistakable because of small size and long and barred tail

### Adult (red phase)

-similar patterns as gray phase but overall plumage is browner, spots on head are cinnamon or buff, and throat and sides are cinnamon-brown

## Juvenile

-similar to adults but with unspotted and grayer head, and fluffy plumage

## Similar Species

The Northern Pygmy-Owl should not be confused with any other owl in Canada and most of the United States. In southern Arizona, Mexico, and Central America it could be easily confused with the Ferruginous Pygmy-Owl, which has a different call and is more rufous-colored. The tiny Elf Owl has a shorter tail, is darker overall, and is nocturnal. In flight, it may resemble a shrike but shrikes have a black facial mask and light gray plumage.

## Other Names

It has also been known as Pygmy Owl, Rocky Mountain Pygmy Owl, Vancouver Pygmy

Owl, California Pygmy Owl, and Dwarf Owl.

### Etymology

The scientific name *Glaucidium gnoma* translates into "little dwarf or gnome owl".

### Mythology

No information on mythology

### RANGE

North America - Resident from central British Columbia (except the Queen Charlotte Islands) and possibly extreme southeastern Alaska, southwestern Alberta, and western Montana south, mostly in mountainous regions, to southern California, extending east as far as central Colorado and New Mexico.

Subspecies - There are 6 recognized subspecies of this owl, 4 of which occur in North America.

*Glaucidium gnoma californicum* - an interior race that occurs from British Columbia south to southern California and northern Arizona and east to northwestern Wyoming, Colorado, and New Mexico.

*Glaucidium gnoma gnoma* - occurs from southern Arizona southward into Mexico

*Glaucidium gnoma grinnelli* - occurs only along the coast from British Columbia (possibly southeastern Alaska) to southern California.

*Glaucidium gnoma swarthi* - found only on Vancouver Island, British Columbia

The Northern Pygmy-Owl also occurs in Baja California, the interior of Mexico, Guatemala, and central Honduras.

### BEHAVIOR

The Northern Pygmy-Owl is very secretive and tends to perch and roost in thickets where it is safe from predators. At times, it will sit atop the highest spire of a tree. When perched it often jerks its tail upwards or moves its head erratically. It makes short rapid flights between perches, plummeting downwards as it leaves a perch before leveling off, and swooping up to the next. It tends to land low in a tree, then moves up through the tree to a higher perch. Its flight is relatively noisy for an owl.

Despite its small size, the Northern Pygmy-Owl is one of the fiercest owls, and will attack prey or drive off intruders several times its own size. It is a "sit and wait" predator, that hunts mainly by vision alone. It dives down onto prey on the ground and drives its talons into the prey's throat. It ferociously attacks birds in shrubs, crashing into its victim. Most prey is carried off in its feet to feeding sites. Birds are usually plucked before being consumed. It often eats only the brains of birds and the soft abdomen of insects. This little owl can carry prey weighing 2 to 3 times its own weight. During winter, surplus prey is cached in a cavity, often in large quantities. These caches help small owls like this meet their metabolic needs during very cold winter periods. Summer caches are usually much smaller.

The Northern Pygmy-Owl is essentially sedentary, except for altitudinal movements downslope in winter. Southward irruptions during winter may occur in years of scarce food supply. They are very unsociable birds, remaining solitary much of the year. There is no information on territory size, but the similar Eurasian Pygmy-Owl has territories from 500 to

4,200 acres (200 to 1,700 hectares), and the Northern Pygmy-Owl likely has similar-sized territories.

There is no information on longevity or mortality. Potential predators of this owl are other owls, jays, crows, ravens, snakes, squirrels, and weasels.

During courtship both sexes call to each other with their mating trill. They also pass food to each other and snuggle closely.

This owl is known to search out other pygmy-owls to chase, as if for fun. When threatened it puffs its feather and spreads its tail to make itself look larger. When hiding, it tries to look thin, faces the danger, and closes its eyes into slits.

## Adaptations

The Northern Pygmy-Owl avoids predation by most larger owls by being active during the day and roosting in thick cover during the night or tight against a tree trunk. It is highly adapted to daytime living, and may have the poorest nighttime vision of all North American owls. Its large, black spots on its nape are thought to help ward off surprise attack from the rear, by making it look larger than it really is.

## HABITAT

The Northern Pygmy-Owl inhabits open forests from valley bottoms up to treeline. In the north these forests are mainly spruce, hemlock, and fir dominated. In southern areas, it favors mixed pine-oak forests. It does not inhabit dense, continuous forest. In all areas it hunts in forest clearings, along the edges of meadows, fields, wetlands, and roadsides, and through old burns and logged areas. For roosting it likes quiet, shady alder thickets. During the breeding season it inhabits open forests with a selection of snags with old woodpecker cavities.

## VOICE

The primary call of the male Northern Pygmy-Owl is a series of repetitive, whistled hoots "too-too-too-too-too-too", separated by pauses of 1 to 2 seconds. The subspecies found from southern Arizona through Central America emits series of double hoots, "too-too, too-too, too-too". This call is territorial in nature and is usually given in the early evening and before dawn, and may be heard year-round. The male gives a softer version of this call when bringing food to his mate. The female calls much less often and it has a cackling quality. Other calls are not well-described but include an ascending staccato series of whistles. When excited, they may emit a high-pitched trill (8 notes/second).

## PELLETS

Pellets are very small, averaging about 1.2 inches (3 centimeters) long. They are formed only occasionally because this owl does not consume large amounts of fur, feathers, or bone. The pellets tend to fall apart shortly after ejection.

## FOODS

The Northern Pygmy-Owl feeds on a wide range of small prey, probably including all small mammals, birds, and reptiles and amphibians in its range. Voles make up the bulk of its diet, with birds comprising most of the rest. Insects may be very important when they are most abundant. It also takes toads, frogs and small lizards and snakes. Other small mammals include shrews, mice, chipmunks, bats, moles, young rabbits, and weasels. Birds

include mainly songbirds, but birds as large as California Quail are taken.

## NESTING

The Northern Pygmy-Owl is almost entirely dependent on old woodpecker cavities for nest sites. It also nests in natural tree cavities and there is one record of a nest in an old Cactus Wren nest. Nest trees are usually dead and are usually coniferous in the boreal forest and deciduous in more southern areas. Nest cavities range from 10 to 75 feet (3 to 23 meters) above ground, averaging about 20 to 23 feet (6 to 7 meters).

Eggs are laid between April and June. Clutch size ranges from 3 to 7 eggs with an average of 3 to 4 eggs. Average clutch size may increase from south to north. Females do most, if not all, of the incubating and brooding with the male bringing food and defending the nest. The incubation period is about 29 days. Unlike all other North American owls, this owl begins incubation only after the clutch is complete, so that young tend to hatch over a period of 1 to 2 days, rather than one every 1 to 2 days. Males increase delivery of food to the nest after young hatch. Young grow quickly, reaching 60% of adult size after 2 weeks. Young fledge at about 30 days, when they are capable of flight. Fledglings are then fed and defended by their parents for a further 20 to 30 days. Family groups tend to break up in late summer or autumn.

Northern Pygmy-Owls are single-brooded. It is not known if replacement clutches are laid. Nest cavities may be used for several consecutive years by the same birds.

## CONSERVATION

The Northern Pygmy-Owl does not come into conflict with man's interests so is not persecuted by people very much. It also frequents forests that are lightly-used by people. They do take more songbirds than other owl species, but also take many rodents and insects that are injurious to crops and forests.

Clearing of dense forests has probably increased habitat because they tend to inhabit edges of forests. But because they are dependent on old woodpecker cavities for nesting silviculture practices that remove snags destroys good nesting habitat.

This little owl is often mobbed by small songbirds such as chickadees, juncos, blackbirds, wrens, and hummingbirds as these birds seem to know that pygmy-owls are highly predatory on songbirds.

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# Northern Saw-whet Owl

*Aegolius acadicus*

## General Description

The Northern Saw-whet Owl is a very small, nocturnal owl of wet and dense woodlands. Although relatively common in lowland areas frequented by man, it is seldom seen. It is a small, short-bodied owl with an overly large head. The head is "earless" and may appear distorted due to an asymmetrical skull. It looks small when perched and tends to shuffle its feet. In flight it appears larger because of its broad wings. Its plumage is quite fluffy and is brownish or reddish brown overall streaked with white underneath and spotted on the back. The crown is finely streaked with white. Its large, bright yellow eyes sit in small grayish facial disks. Its legs and feet are a light buff and are heavily feathered. The bill is black.

## Size

This owl is the 13th largest owl in North America, but is the smallest eastern owl. Females are slightly larger than males. Lengths average 7.8 inches (20 centimeters) for females and 7.7 inches (19 centimeters) for males. Wingspans average 20 inches (52 centimeters) for females and 19.5 inches (49 centimeters) for males. Weights average 3.8 ounces (107 grams) for females and 3.6 ounces (102 grams) for males.

## Morphs

The Northern Saw-whet Owl is monotypic with little individual variation in plumage.

## Specific Description

### Adult

- refer to above
- small with an overly large, earless head and fluffy plumage
- light buffy legs

### Juvenile

- wings and tail similar to adults
- underparts and upperparts a uniform dark brown
- face blackish with whitish "eyebrows"

## Similar Species

The Northern Saw-whet Owl can be confused with the Boreal Owl which has a similar plumage pattern and shape, but is larger and darker. The forehead of the Northern Saw-whet Owl is streaked, while spots adorn the forehead of the Boreal Owl. In addition the Boreal has a yellow/white bill. The Flammulated Owl has dark, rather than yellow eyes. The Elf Owl and both pygmy-owls have very small facial disks, smaller heads, and longer tails.

## Other Names

It has also been known as Acadian Owl, Sparrow Owl, White-fronted Owl, Farmland Owl, Little Nightbird, Queen Charlotte Owl, and La Petite Nyctale (Fr: The Little Night Owl).

## Etymology

The scientific name *Aegolius acadicus* translates into "bird of ill omen from Acadia".

Acadia is the name of the Atlantic provinces and northern New England states first settled by pioneers from France.

## Mythology

The Menominee people believed that day and night were created after a talking contest between a saw-whet owl (Totoba) and a rabbit (Wabus). The rabbit won and selected daylight, but allowed nighttime as a benefit to the vanquished owl. The Montagnais people of Quebec believed it was once the largest owl in the world and was very proud of its voice. After the owl attempted to imitate the roar of a waterfall, the Great Spirit humiliated the saw-whet owl by turning it into a tiny owl with a song that sounds like slowly dripping water.

## RANGE

North America - Breeds from southeastern Alaska, central British Columbia, including the Queen Charlotte Islands, central Alberta, central Saskatchewan, central Manitoba, central Ontario, southern Quebec, northern New Brunswick, Prince Edward Island, and Nova Scotia, south to the mountains of southern California to southern New Mexico, locally in western South Dakota and western Minnesota, northern Illinois, southern Michigan, central Ohio, West Virginia, western Maryland, and New York; also breeds locally in the mountains of eastern Tennessee and western North Carolina.

Winters generally throughout much of breeding range, but part of the population migrates south regularly to the central United States and irregularly to more southern areas along the Gulf coast and central Florida.

Subspecies - There are 2 subspecies resident in North America.

*Aegolius acadicus acadicus* - occurs throughout North America except on the Queen Charlotte Islands, British Columbia.

*Aegolius acadicus brooksi* - confined to the Queen Charlotte Islands.

The Northern Saw-whet Owl is also found in Mexico.

## BEHAVIOR

The Northern Saw-whet Owl is rarely seen because of its nocturnal habits. During the day it roosts in thick foliage of coniferous and deciduous trees. If found during the day, it can be easily handled by humans. When perched at night it moves its head constantly, often into contorted positions. In flight, it moves rapidly, with a strange undulating flight reminiscent of woodpeckers. It also flies batlike when looking for prey. When leaving a nest hole it drops swiftly, flies quickly near the forest floor, then swoops up to a perch.

This owl hunts mainly at dusk and dawn and is a "sit and wait" predator. It drops directly down onto prey on the ground from low hunting perches and attacks ferociously. It also ranges through wooded areas and hunts in heavy shrub cover. When prey is plentiful, it will kill and cache as many as 6 mice in rapid succession, without consuming any. Excess food is cached in safe places and, in winter, is thawed out later by "brooding" the frozen carcass. When food is plentiful, it may eat only the head of each prey.

The Northern Saw-whet Owl is highly migratory in northern and eastern areas. Two major migration corridors in eastern North America are along the Atlantic coastline and down the Ohio River valley. Juveniles are more likely to migrate than adults and tend to move further south. Migration in the fall often occurs during the passage of a cold front and during westerly winds. Southern populations move downslope during winter rather than migrating

south. Home ranges vary from about 200 to 370 acres (80 to 150 hectares). Breeding densities may reach 13 to 15 territorial males / square mile (5 to 6 / square kilometers).

Little is known about longevity or mortality. Captive owls have lived for 8 years, but mortality in the wild is likely relatively high. This owl competes with Boreal Owls, starlings, and squirrels for nest cavities and is preyed upon by larger owls, marten, Cooper's Hawk, and Northern Goshawk.

Because of its nomadic nature it is unlikely that pair bonds are permanent or that birds often return to the same nest site. Males sing their territorial song mainly in April. After a female has been attracted to a male by his song, he will fly in circles above her while calling. The male then lands near her and begins a complex series of bobbing and shuffling as he inches towards her. Often, the male has a mouse in its bill and offers it to the female. Courtship feeding probably precedes copulation.

When threatened it will elongate its body in the same way the Boreal Owl does, in order to appear like a tree branch or bump. It tends to depend on its plumage for camouflage when roosting in foliage.

### Adaptations

During the day, this owl typically roosts in the outer edge of a drooping conifer branch, wedged tightly between the upper mainstem and downsloping perch twig. It has a very light wing loading due to its long and broad wings and small size, which allows it to maneuver through thick cover and hunt areas unavailable to other small owls. Its radically asymmetrical ear openings result in a deformed skull shape, but are very useful in locating prey by hearing alone.

### HABITAT

The Northern Saw-whet Owl inhabits coniferous and deciduous forests, with thickets of second-growth or shrubs, at lower elevations than the similar Boreal Owl. It tends to occur mainly in forests with deciduous trees, where it is dependent on woodpecker cavities for nest sites. Breeding habitat is usually swampy or wet, rather than dry. Riparian habitat is often preferred. In the east, it breeds mainly above 5,000 feet (1,500 meters) elevation. In Colorado, it nests between 5,600 to 10,200 feet (1,700 to 3,100 meters) elevation. Roosting habitat often has smaller, denser conifers underneath an oldgrowth canopy and the owls tend to roost in the smaller trees. It also roosts in groves of dense conifers, shrubs, and hedgerows. It hunts in woodlands, along the edges of clearings, and in open fields.

### VOICE

The Northern Saw-whet Owl vocalizes only during the breeding season, usually between March and May. It is silent at other times of the year. The primary courtship call is a monotonous, whistled "hoop", emitted at about 1.5 notes per second with clock-like precision, and may last for several hours without a break. Territorial calls are series of short clear notes. The saw-whet owl's name came from its "skiew" call that is uttered when alarmed, and sounds something like the whetting of a saw. When the male flies to the nest with food it gives a rapid staccato burst of toots, and the female responds with a soft "swEE".

### PELLETS

Pellets are very small, about 0.75 inches (1.9 centimeters) long and 0.5 inches (1.3 centimeters) thick. They are ejected with great difficulty, with much twisting of the body and

head.

## FOODS

The Northern Saw-whet Owl feeds almost entirely on small mammals. Deer mice are its primary prey, followed by shrews and voles. Other mammals include squirrels, moles, bats, flying squirrels, and house mice. Small birds are taken infrequently and include swallows, sparrows, chickadees, and kinglets. Larger birds such as Northern Cardinal and Rock Dove can be killed by this little owl. Frogs and insects are also taken.

## NESTING

This owl nests in old woodpecker cavities, primarily those made by Northern Flickers or Hairy Woodpeckers, or in natural cavities. It will also nest readily in nest boxes. Nest trees are often dead and nest heights average 13 to 20 feet (4 to 6 meters) above ground. Nesting occurs between March and July.

Clutch sizes range from 4 to 7 eggs, but average 5 to 6 eggs. Eggs are laid every 1 to 3 days, but usually every second day. The female does all incubation and the male brings food to her and defends the nesting area. The incubation period is 26 to 28 days. Young fledge at 4 to 5 weeks, and may leave the nest individually every 1 to 2 days, until they have all left. As in all owls, younger chicks are often cannibalized by older siblings.

It is usually single brooded, but during years when food is abundant, it may be double or even triple brooded. Some nest failures are caused by infestations of bloodsucking, wingless flies which kill the nestlings.

## CONSERVATION

Clearcut logging of montane and lowland forests reduces habitat by removing forest cover and snags used for nesting. Populations may be retained in selectively logged areas, especially if snags useful for nesting are retained. This little owl is susceptible to sudden heavy snowfalls and temperature drops because its prey becomes inaccessible and the owl's high metabolic rate cannot be refueled adequately.

Nest box programs are useful in increasing populations where there are few suitable woodpecker cavities available.

Because of its dependency on cavities some state and provincial wildlife agencies have listed this tiny owl as a species of special concern.

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# Short-eared Owl

*Asio flammeus*

## General Description

The Short-eared Owl is a medium-sized, diurnal and nocturnal owl of open grasslands and fields. It is widely distributed throughout most of North America. It is often seen hunting over farm fields or perched on roadside fenceposts or telephone wires. When perched it leans forward, more hawklike than other owls, and appears bulky rather than sleek. Its head appears round without ear tufts, but at very close range small ear tufts are visible. Its plumage is buffy brown with dark streaks on the chest, belly, and back. Its wings and tail are strongly barred. Its lemon yellow eyes are encircled with black and set in whitish or buffy-white facial disks. The facial disks are suffused with a ring of brown. The bill is black. In flight, the dark "wrist" on the underwing is the key field mark.

## Size

The Short-eared Owl is the 7th largest North American owl. Females are 5 to 10% larger than males. Lengths average 16 inches (40 centimeters) for females and 15 inches (38 centimeters) for males. Wingspans average 42 inches (107 centimeters) for females and 41 inches (105 centimeters) for males. Weights average 12 ounces (337 grams) for females and 10 ounces (287 grams) for males.

## Morphs

Short-eared Owls are monotypic although there is much, but subtle, individual variation in the extent of barring and background color. Males tends to be lighter in color than females.

## Specific Description

### Adult

- refer to above
- medium-sized, earless owl active during the day
- very pale round facial disks
- large buffy wing patches are visible in flight

### Juvenile

- similar to adults but darker, plainer plumage
- face is brown rather than whitish

## Similar Species

The Short-eared Owl can be confused with Barn Owls because both are light-colored, but the Barn Owl has heart-shaped facial disks and is paler. Long-eared Owls are similar in size and can be mistaken for Short-eared Owls at night, but are darker and have prominent ear tufts. In flight the latter has a small "wrist" patch, buffy underwings, and a darker belly. Northern Harriers hunt in similar habitats but they have a white rump patch, longer tail, and more uniform plumage color.

## Other Names

It has also been known as Grass Owl, Marsh Owl, Prairie Owl, Flat-faced Owl, Palmetto Owl, Woodcock Owl, and Meadow Owl.

## Etymology

The scientific name *Asio flammeus* translates into "flaming or flame-colored eared owl".

## Mythology

The Inuit believed that the Short-eared Owl was once a young girl who was magically transformed into an owl with a long beak. But the owl became frightened and flew into the side of a house, flattening its face and beak.

## RANGE

North America - Breeds from northern Alaska, northern Yukon, northern Mackenzie, central Keewatin, probably southern Baffin Island, northern Quebec, northern Labrador, and Newfoundland south to the eastern Aleutian Islands, southern Alaska, central and southwestern British Columbia, to central California, northern Nevada, Utah, northeastern Colorado, Kansas, Montana, southern Illinois, northern Indiana, northern Ohio, Pennsylvania, New Jersey, and northern Virginia.

Winters in some areas of southern Canada south to Baja California, the Gulf Coast, and southern Florida.

Subspecies -There are 8 or 9 races in the world, many of which are restricted to islands. There is only 1 subspecies in North America.

*Asio flammeus flammeus* - occurs in North America as well as in throughout the Old World.

The Short-eared Owl also occurs widely in the Old World, in Iceland, the Hawaiian Islands, Galapagos Islands, and South America.

## BEHAVIOR

The Short-eared Owl has a bouncy, buoyant flight with its body seeming to rise up and down while its wing tips remain fairly level. It glides, flaps erratically, swoops up, and dives down and is capable of remarkable aerial maneuvers. It holds its wings high when turning, and swivels its head constantly. It may fly quite high 160 to 320 feet (50 to 100 meters) during the breeding season and when migrating.

The Short-eared Owl hunts mainly at night and during the morning and late afternoon. It ranges over open areas, a few feet above ground, and pounces immediately when prey is located. In dense vegetation it will hover over prey, often for extended periods when facing into the wind, before pouncing. Small prey is swallowed whole or in pieces. It does not pluck birds but pulls the wings off before eating. Unlike most owls, prey is normally carried in its talons. It occasionally hunts from a perch or while standing on the ground.

The Short-eared Owl is highly migratory, and nomadic, except in southern parts of its range. Movements of up to 1,200 miles (2,000 kilometers) have been documented. This owl has relatively small nesting territories and home ranges, varying from 35 to 500 acres (15 to 200 hectares), and may nest in loose colonies in excellent habitat. Breeding densities in Manitoba were 1.5 pairs per square mile (0.6 pairs square kilometers). Because of its nomadic tendencies, mate and site fidelity are very low. Breeders tend to wander until they find areas with high densities of prey before settling to breed. In winter, large numbers of owls will occur in areas with lots of food. Communal winter roosts of up to 200 birds are known, with these birds ranging over nearby areas to hunt. Resident owls will defend winter

foraging territories of about 15 acres (6 hectares), before expanding the territory size during the breeding season. Short-eared Owls and Northern Harriers often harass each other when hunting the same field, and harriers often steal food from the owl. Short-eared Owls mob large day-flying birds like eagles, herons, hawks, Turkey Vultures, and bitterns, seemingly for amusement.

Wild owls have reached almost 13 years of age. Predators of this owl include many diurnal raptors such as the Bald Eagle, Northern Goshawk, Gyrfalcon, Red-tailed Hawk, and Snowy Owl. Jaegers, gulls, ravens, and crows steal eggs and small young. Large numbers of Short-eared Owls are killed by collision with vehicles. This owl is also attracted to the wide open fields of airports and many are killed by collision with aircraft. It is very vulnerable to mammalian predators such as skunks, dogs, foxes, and coyotes because it nests on the ground.

Courtship and territorial behavior is spectacular for an owl. Males perform aerial displays by rising quickly with rhythmic and exaggerated wing beats, hovering, gliding down, and rising again, often to 650 to 1,300 feet (200 to 400 meters) above ground. Wing claps, in bursts of 2 to 6 per second, are often made during this flight and some singing occurs. The flight can be ended with a spectacular descent where the male hold his wings aloft and shimmies rapidly to the ground. Two birds may engage in flight, locking talons, and fighting briefly. Often, a display where one bird flashes its light underwing towards another is used during territorial and courtship flights. Copulation occurs on the ground and is preceded by hooting and calling and courtship feeding.

When threatened on the ground, it crouches, spreads its wings and leans forward in order to appear larger. When defending its nest, it will feign injury and try to lead an intruder away. If this fails, it will circle overhead and dive-bomb, but contact is rarely made. Nestlings tend to scatter into the surrounding vegetation to hide.

### Adaptations

Its ruddy brown plumage is well camouflaged when this owl hides in heavy grass, marsh reeds, or under tufts of grass. At times the Short-eared Owl will feign death to avoid detection. It has good daytime vision and is the most diurnal of all North American owls.

Because reproductive success is relatively poor, the ability to lay large clutches helps populations recover after periodic declines. Nestlings fledge very quickly, an adaptation for a ground-nesting species to reduce the amount of time they are vulnerable to predation.

### HABITAT

Short-eared Owls inhabit wide open spaces such as grasslands, prairie, agricultural fields, salt marshes, estuaries, mountain meadows, and alpine and Arctic tundra. Breeding habitat must have sufficient ground cover to conceal nests and nearby sources of small mammals for food. Hunting habitat is mainly open with low vegetation, but they will also hunt over brushy areas and through sparsely treed sites. Roosting sites are characterized by heavy, low vegetation for shelter, nearby hunting areas, and being relatively free from disturbance. Communal roosts occur in oldgrowth fields, along thick hedgerows, in overgrown rubble in abandoned fields, or in clumps of dense conifers. This owl tends to roost in trees only when snow covers the ground. During migration, the Short-eared Owl will move through high mountain passes, flying at great heights.

### VOICE

The Short-eared Owl is our most silent owl, owing to its diurnal nature and wide open

habitats where visual displays would seem more appropriate than in forests. The male's territorial song is a pulsing "voo-hoo-hoo....", of at least 6 notes resembling an old steam engine. This song is given mainly during flight displays. The female responds with a barking "kee-ow". When excited near the nest, both sexes squawk, bark, hiss and squeal.

## PELLETS

Pellets are medium-sized, averaging about 2 by 1 inch (5.1 by 2.5 centimeters)

## FOODS

Short-eared Owls eat mainly small mammals (95% of diet) and birds (5%). Meadow voles (*Microtus* species) are its primary prey, likely because voles are usually the most abundant prey type in the open grassy habitats that this owl frequents. Deer mice, shrews, ground squirrels, pocket gophers, pocket mice, moles, rats, bats, rabbits, and muskrats are also taken. Birds probably are more important when Short-eared Owls hunt in marshes and along coastal areas, where they can target shorebirds, terns, and small gulls and seabirds. In inland habitats they take mainly Horned Larks, meadowlarks, blackbirds, and pipits. A few insects such as roaches, grasshoppers, beetles, katydids, and caterpillars are also taken.

## NESTING

The Short-eared Owl nests on the ground, unlike any other North American owl except for the Snowy Owl and very rarely the Long-eared Owl. Nests are usually situated in the shelter of a grass mound, under a grass tuft, or among herbaceous ground cover. Nests are loosely constructed by the female, who scrapes a spot on the ground and then lines the scrape with grass stems, herb stalks, and feathers plucked from her breast.

Clutch sizes are large for owls, ranging from 4 to 14 eggs, but averaging 5 to 7 eggs. Clutch size increases from south to north. Large clutches are laid during years of high food abundance. Eggs are laid every 1 to 2 days and incubation commences with the first egg laid. Incubation is done largely by the female, with the male bringing food to the nest and occasionally taking a turn incubating. Young grow very rapidly after hatching, and begin to wander from the nest as soon as 12 days. Young fledge at about 4 weeks.

The Short-eared Owl routinely lays replacement clutches, because of high predation rates. In southern areas, it may raise 2 broods in 1 year.

## CONSERVATION

Populations of Short-eared Owls are difficult to assess because of their nomadic nature. Local declines have occurred because of urbanization and industrialization of old fallow fields, and conversion of grasslands and marshes to intensely farmed crops. Shooting, trapping, pesticides and other chemical contaminants also pose threats. Burning of fallow fields in spring often destroys nests. Predators can find nests more easily in areas where owls are forced to nest in small patches of habitat because of intensive farming practices. The relative importance of alpine-nesting populations to overall populations is unknown.

The Short-eared Owl is very beneficial to man because of the high proportion of small rodents in its diet.

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# Snowy Owl

*Nyctea scandiaca*

## General Description

The Snowy Owl is a very large, diurnal owl of the Arctic tundra. During the winter it occurs in open fields of southern Canada and the northern United States. It is our largest owl and its nearly pure white plumage is unmistakable. It has a relatively small, round head, without visible ear tufts, and yellow eyes. Its overall white plumage is variably barred or speckled with thin, black, horizontal bars or spots. Females and juveniles are more heavily marked than males. It is a powerful flier, usually seen skimming over the ground or perched on a post or scrubby tree.

## Size

The Snowy Owl is the largest North American owl. Females are about 10% larger than males. Lengths average 26 inches (66 centimeters) for females and 23 inches (59 centimeters) for males. Wingspans average 65 inches (164 centimeters) for females and 62 inches (158 centimeters) for males. Weights average 3.75 pounds (1,707 grams) for females and 3.55 pounds (1,612 grams) for males.

## Morphs

The Snowy Owl is monotypic, although there is much individual variation in the extent of black barring and speckling.

## Specific Description

### Adult

- refer to above
- all white, very large, diurnal owl

### Juvenile

- sooty gray or similar to adults but more dark marks

## Similar Species

Snowy Owls could be confused with Arctic Great Horned Owls, which are very pale, but have prominent ear tufts, which are absent in Snowy Owls. White phase Gyrfalcons and ptarmigan in winter are both white-plumaged birds but look nothing like an owl. Barn Owls look almost white, especially when seen at night, but have prominent facial discs and an orangish-brown back

## Other Names

It has also been known as Arctic Owl, Great White Owl, White Owl, Tundra Ghost, Ookpik, Scandinavian Nightbird, Ghost Owl, Ermine Owl, White Terror of the North, and Highland Tundra Owl.

## Etymology

The scientific name *Nyctea scandiaca* translates into "nocturnal owl of Scandinavia".

## Mythology

In parts of northern England it is good luck to see a Snowy Owl. In Romania, the souls of repentant sinners flew to heaven in the guise of a Snowy Owl. In ancient Greece, a magical "inner light" gives owls night vision. From rock paintings in France, the Snowy Owl is the oldest recognized bird species in paleolithic rock art.

## RANGE

North America - Breeds in the western Aleutian Islands, and from northern Alaska, northern Yukon, and Prince Patrick and northern Ellesmere islands south to coastal western Alaska, northern Mackenzie, southern Keewatin, extreme northeastern Manitoba, Southampton and Belcher islands, northern Quebec and northern Labrador.

Winters irregularly from breeding range south to southern Canada and northern United States including Minnesota and New York. In some years small numbers may reach as far south as central California, southern Nevada, Utah, Colorado, Oklahoma, central and southeastern Texas, the Gulf States and Georgia.

There are no recognized subspecies of this owl.

The Snowy Owl also occurs widely in northern Eurasia.

## BEHAVIOR

The Snowy Owl has a direct, strong, and steady flight with deliberate, powerful downstrokes and quick upstrokes. It makes short flights, close to the ground, from perch to perch, and usually perches on the ground or a low post. Most hunting is done in the "sit and wait" style. Its head may swivel as much as 270 degrees as it constantly turns its head searching for prey. This owl is highly diurnal, although it may hunt at night as well. Prey are captured on the ground, in the air, or snatched off the surface of water bodies. When taking snowshoe hares, it sinks its talons into the back, backflaps until the hare is exhausted then breaks its neck with its beak. This owl often raids traplines for trapped animals and bait, and will learn to follow traplines regularly. These owls also fish by snatching fish with talons. Small prey up to small hares are swallowed whole, while larger prey are carried away and torn into large chunks. Small young are fed boneless and furless pieces. Large prey are carried in talons, with prey like lemmings being carried in its beak.

The Snowy Owl is highly nomadic. During periods of lemming and vole population crashes in the Arctic, mass movements of Snowy Owls occur into southern Canada and northern United States. These invasions occur every 3 to 5 years, but are highly irregular. Adult females stay furthest north while immature males move furthest south during these incursions. There is little breeding site-faithfulness between years or mates in some areas, but in other areas, a pair of owls may nest in the same spot for several years. Territories around nests range from 0.6 to 2.5 square miles (1.5 to 6.5 square kilometers), and overlap with other pairs. Densities on Banks Island ranged from 1 owl/square mile (2.6 kilometers square) in good lemming years to 1 owl/10 square miles (26 square kilometers) in low lemming years. It is generally "shy" and nonaggressive except during the nesting season when it may attack intruders up to .6 miles (1kilometer) from its nest.

The Snowy Owl is likely a long-lived bird, reaching at least 9.5 years in the wild and 35 years in captivity. It has few natural enemies except Arctic fox and wolves on its tundra breeding grounds. Skuas and jaegers may take eggs or young.

During courtship, males fly in undulating, moth-like flight when females are visible. On the ground males bow, fluff feathers, and strut around with wings spread and dragging on



the ground. Males kill and display prey in caches to impress females, often feeding the female prior to copulation. Courtship behavior can begin in midwinter, well away from breeding areas. When threatened at nests, birds lean forward and hoot loudly.

### Adaptations

The Snowy Owl has better daytime vision than most other owls. Clutch and brood sizes are heavily dependent on food supply. It may not nest at all during years of low lemming abundance. When laying large clutches, total clutch mass may reach 43% of female weight, an exceptionally high ratio for owls. Snowy Owls do not hunt near their nests and other birds, such as Snow Geese, nest nearby and take advantage of the owls driving off predators like foxes. During hot weather, it thermoregulates by panting and spreading its wings.

### HABITAT

The Snowy Owl is a bird of Arctic tundra or open grasslands and fields. It rarely occurs in forested areas. During southward movements it shows up along lakeshores, marine coastlines, marshes, and even roosts on buildings in cities and towns. In the Arctic, it breeds from low valley floors up to mountain slopes and plateaus over 3,000 feet (1,000 meters) in elevation. When wintering in the Arctic, it frequents wind-swept tundra with little snow or ice accumulation. At more southern latitudes it typically frequents agricultural areas.

It normally roosts on pingaluks (rises in the tundra) in the Arctic and on the ground, on fence posts, driftlogs, or in scrubby trees further south. Sometimes it may perch on buildings and television antennas in the middle of large cities.

### VOICE

The Snowy Owl is virtually silent during nonbreeding seasons. During the breeding season males have a loud, booming "hoo, hoo" given as a territorial advertisement or mating call. Hooting occurs from the ground or in the air. Females rarely hoot. Its attack call is a guttural "krufff-guh-guh-guk". When excited it may emit a loud "hooo-uh, hooo-uh, hooo-uh, wuh-wuh-wuh". Other sounds are dog-like barks, rattling cackles, shrieks, hissing, and bill-snapping.

Nestlings "cheep" up to 2 weeks of age, then hiss and squeal.

### PELLETS

Snowy Owls produce large, rough-looking cylindrical pellets with numerous bones, feathers, and fur showing. They are usually expelled at traditional roosting sites and large numbers of pellets can be found in one spot. When large prey are eaten in small pieces, with little roughage, pellets will not be produced.

### FOODS

Snowy Owls are mainly dependent on lemmings and voles throughout most of their Arctic and wintering range. When these prey are scarce they are an opportunistic feeder and will take a wide range of small mammals and birds. In upland habitats rodents predominate while in marshlands, waterfowl predominate. Birds wintering on south coastal Vancouver Island eat mainly Horned Grebes and ducks weighing 0.9 to 1.8 pounds (400 to 800 grams), like the Bufflehead. Some mammal prey include mice, hares, muskrats, marmots, squirrels, rabbits, prairie dogs, rats, moles, and entrapped furbearers. Birds include ptarmigan, ducks, shorebirds, Ring-necked Pheasants, grouse, American coots, grebes, gulls, songbirds, and Short-eared Owls. It also takes fish and carrion.

Some nesting owls switch from lemmings and voles to young ptarmigan when they become available.

## NESTING

The Snowy Owl nests almost exclusively on the ground, where the female makes a shallow scrape with her talons on top of an elevated rise, mound, or boulder. Abandoned eagle nests and gravel bars are used very rarely. Nests may be lined with scraps of vegetation and owl feathers. Nest sites must be near good hunting areas, be snow-free, and command a view of surroundings. Nests are often in windswept locations. Nests may be reused over many years.

Clutch sizes normally range from 5 to 8 eggs but may be as many as 14 eggs during high lemming years. The female does all of the incubating and brooding of eggs and young, whereas the male hunts and guards the nest. Egg-laying is highly synchronous throughout its range, usually beginning between 10 to 22 May. Incubation must begin with the first egg laid to prevent freezing and cracking of eggs. Young hatch about two days apart, leading to large age differences in nests with large clutch sizes. Young begin to leave the nest after about 25 days, well before they can fly, but can only fly well after 50 to 60 days. Nestling owls require about 2 lemmings/day and a family of owls may eat as many as 1,500 lemmings before the young disperse. Snowy Owls are single brooded and likely do not lay replacement clutches if their first clutch is lost. Almost 100% nesting success can be achieved during good vole years. Yearling owls probably do not breed.

## CONSERVATION

Snowy Owls have long been persecuted by man, often being shot for food, sport, or trophies. Native peoples have harvested this owl for millennia for food, feathers, and talons. In southern areas, they are attracted to the wide-open spaces of airports and are a threat to collide with aircraft. Snowy Owls were once routinely shot to remove them from airports but are now trapped and relocated. Numbers fluctuate wildly, usually in concert with lemming and vole numbers. Banks Island may have 15,000 to 20,000 Snowy Owls during good lemming years and only 2,000 during low lemming years.

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# Spotted Owl

*Strix occidentalis*

## General Description

The Spotted Owl is a large, nocturnal, woodland owl of western North America. It is darkly colored, has a round head with no ear tufts, and dark brown eyes. Its brown plumage is heavily spotted with white on the breast and belly, less so on the wings, back, and head. The pale brown facial disks are concentrically ringed with dark brown. The eyebrows, lores, and bill are grayish. Its plumage is soft and fluffy, allowing completely silent flight. In flight it has heavy methodical wing beats, but appears buoyant for its size.

## Size

The Spotted Owl is the 5th largest owl in North America. Females are about 10% larger than males. Lengths average 19 inches (48 centimeters) for females and 18 inches (46 centimeters) for males. Wingspans average 43 inches (109 centimeters) for females and 42 inches (106 centimeters) for males. Weights average 1.1 pounds (502 grams) for females and .86 pounds (391 grams) for males.

## Morphs

The Spotted Owl is monotypic with little general plumage variation except for the extent of spotting.

## Specific Description

### Adult

- refer to above
- dark eyes, earless, large size
- profuse white spotting on dark brown plumage

### Juvenile

- pale brown plumage overall, broadly barred with buff except the head and legs which are a uniform pale brown

## Similar Species

The Spotted Owl is most easily confused with the Barred Owl. The Barred Owl has a similar shape, size, and dark eyes, but is grayish, rather than brown, is marked with dark vertical bars on its underparts, rather than with light spots, sits more erect, and has a much different primary call. The Great Gray Owl has a similar shape but is larger and has yellow eyes. The Great Horned Owl has yellow eyes, prominent ear tufts, and is much larger.

## Other Names

It has also been known as Northern Spotted Owl, California Spotted Owl, Mexican Spotted Owl, Arizona Spotted Owl, Western Barred Owl, Wood Owl, Hoot Owl, and Canyon Owl.

## Etymology

The scientific name *Strix occidentalis* translates, rather pedantically, into "western screech owl".

## Mythology

No information available.

## RANGE

North America - Resident in the mountains and in the humid coastal forest from southwestern mainland British Columbia south through western Washington and western Oregon to southern California; and in the Rocky Mountain region of the interior from southern Utah and southwestern and south-central Colorado south through the mountains of Arizona, New Mexico, and extreme northwestern Texas.

Subspecies - There are 3 recognized subspecies of this owl all of which are found in North America. The race *S. o. caurina* is known as the "Northern" Spotted Owl, *S. o. lucida* as the "Mexican" Spotted Owl, and *S. o. occidentalis* as the "California" Spotted Owl.

*Strix occidentalis caurina* - occurs from extreme southwestern mainland British Columbia along in the coastal mountains ranges to central California.

*Strix occidentalis lucida* - occurs from southeastern Utah, south-central and southwestern Colorado, south through eastern Arizona, New Mexico, and extreme northwestern Texas.

*Strix occidentalis occidentalis* - occurs in the coastal mountain ranges and western slopes of the Sierra Nevada Mountains in California.

The Spotted Owl also occurs in Mexico.

## BEHAVIOR

The Spotted Owl is a placid owl, allowing close approach by humans and being reluctant to fly. Unlike most other owls, it may not defend its eggs and young from predators, watching nearby as the nest is destroyed.

Hunting is done mainly at night, usually beginning just after sunset and ending a half hour before sunrise. It is a "sit and wait" predator that dives down onto prey after locating it. Foraging while in flight is very rare. Prey is usually consumed immediately but some is cached for later use. Prey taken to the nest by the male is often decapitated first. During the day, it may take the odd prey that passes by its dayroost, fly to a food cache, or fly to a nearby stream to drink. The Spotted Owl is known to walk around campgrounds at night to pick up scraps of food.

The Spotted Owl is generally nonmigratory, except that some downslope movement from mountains may occur in winter. Adults tend to remain near their traditional nesting territories, while juveniles disperse widely, as much as 60 to 125 miles (100 to 200 kilometers). Breeding territories can be 370 to 1,240 acres (150 to 500 hectares) and winter home ranges may reach 8 square miles (20 square kilometers). Densities can be between 1 pair in every 1 to 2 square miles (3 to 5 square kilometers) in areas of good habitat.

This is a long-lived owl with captive owls of 21 years being known. Mortality in the wild is thought to be very high (60 to 95%) for juveniles, especially during the dispersal stage. Adult mortality is estimated at 5 to 20% annually. Great Horned Owls are likely the only major predator of Spotted Owls, and most juveniles likely starve to death. It is thought that Barred Owls will outcompete Spotted Owls for habitat, by being more aggressive, when the two species come into contact.

Spotted Owls do not breed until they are 2 years of age. Once paired, mates remain faithful for life, but a new mate is readily taken when the other disappears. Pair bonds as long as 8 years are known. Prior to egg-laying, copulation occurs nightly, usually at dusk. Pairs typically leave their roost at dusk, call for a few minutes, then the male flies to the female (which gives a copulation call) and treads her wings, and then copulates with her.

## Adaptations

Its ears are placed asymmetrically and it uses triangulation of sounds to locate prey at night, as in the Barn Owl. It has excellent daytime and nighttime vision. The Spotted Owl responds to temperature variation by moving within the canopy to find the right microclimate. When very hot, it will roost on the north side of slopes, or move to the lower third of a tree, often near a stream.

The Spotted Owl is adapted to a narrow ecological niche in old-growth west coast forests. Its dark plumage is adapted for camouflage in shady forests. Resident owls learn their neighbour's calls, which allows recognition of individuals, and aids in avoiding energy-draining conflicts over territory.

## HABITAT

The Spotted Owl is a bird of dense, dark, old-growth or mixed mature and old-growth coniferous forests. Forests are usually dominated by firs or Douglas-fir, but they also use mature hardwood forests of cottonwoods, alders, oak, and sycamore, especially along steep-walled river valleys. They prefer an uneven and multilayered canopy. In one Oregon study, 98% of 636 sites were in old-growth forests (over 200 years old). Virtually all foraging and roosting was done in old-growth, with recently cleared or burned forests not used at all. Some nesting occurs in older second-growth (70 to 140 years old). This owl prefers shaded mountain slopes and canyons over flat plateau areas. When roosting it sits on a branch, near the trunk, where it is camouflaged against tree bark and shadows.

Its dependency on old-growth forest may be linked to nest-site availability, broad temperature gradients, and diverse roosting and hunting areas.

## VOICE

All calls are relatively low-pitched, pure tones. The typical advertisement call of this owl is a mellow, 4-note hoot, "hoo-hoohoo-hoo". It is given by both sexes and serves as a territorial call and mate-locating call. During territorial disputes it gives a more excited version of the 4-note call. Other calls are 1) the "series location call", a series of 7 to 15 hoots, given during disputes and or calls between paired birds 2) a "bark series" of 3 to 7 loud, rapid barks, given mainly by the female during territorial squabbles, and 3) the "nest call" given during the prenesting period. Other sounds given when alarmed include grunts, groans, and chatters. The female often emits a loud "co-weeep" to contact her mate. During copulation the male hoots and the female chatters.

## PELLETS

Pellets are large and compact measuring about 2 to 3 inches (5.1 to 7.6 centimeters) in length. Pellets contain numerous bones, skulls, and teeth, and are held together by fur and mucus.

## FOODS

The Spotted Owl feeds mainly on northern flying squirrels and wood rats and this owl's

distribution is often limited by the distribution of these two prey species. In Oregon, flying squirrels are the primary prey, but in Arizona, wood rats are more important. Other major prey include rabbits and hares. Large prey such as flying squirrels and wood rats are necessary for successful breeding. Summer diets are more varied with deer mice and voles being important foods. Spotted Owls are known to capture 30 mammal species and 23 bird species as prey. They also eat snakes, crickets, beetles, and moths.

## NESTING

The Spotted Owl nests primarily in stick nests of Northern Goshawks, on clumps of mistletoe, in large tree cavities, on broken tops of large trees, on large branches, or cavities in banks and rock faces. In the eastern Cascade Mountains of Washington, 55.3% of 85 nests were in old Northern Goshawk nests whereas, in Oregon, 64% of 47 nests were in tree cavities. Most nests were in large-diameter Douglas-firs, almost always in live trees. Nest heights averaged about 90 feet (27 meters) above the ground.

Old nests are not repaired before eggs are laid. Nests tend to be reused year after year. Clutch size ranges from 2 to 4 eggs, but averages 2 to 3 eggs. Eggs are laid every 3 to 4 days, usually in April. The female does all incubation and the male delivers food to the nest. The incubation period is about 28 to 32 days. Young are brooded constantly by the female for 2 weeks, then she begins to hunt as well. The male brings food, which he has decapitated and eaten the head, to the nest and passes it to the female to feed to the young. Young start roaming from the nest onto nearby branches at about 5 weeks, but some flutter to the ground before climbing up into trees. They can fly weakly at about 6 weeks. At 9 to 10 weeks young can capture insect prey by themselves. Families remain loosely associated during summer before young disperse in the autumn.

## CONSERVATION

The Spotted Owl may be the most publicized of all endangered species in North America. Because of its dependence on large tracts of old-growth coniferous forests, management for this owl has caused tremendous turmoil in the forest harvesting industry, and has spawned an incredible amount of research. The Spotted Owl symbolizes the trade-offs of economic development versus conservation of natural ecosystems.

The Spotted Owl requires large areas of multi-layered old-growth forest, interconnected with corridors of old-growth to provide routes for dispersal. Some silviculture methods such as very selective harvesting and snag retention may be compatible with Spotted Owls, but clearcutting completely eliminates habitat; the resulting even-aged stands after clearcutting are not suitable habitat. Because the Spotted Owl will only nest in younger stands when old Northern Goshawk nests are present, management for Northern Goshawks may be critical to the management of Spotted Owls.

During the last 2 to 3 decades, the closely related Barred Owl has begun to invade the range of the Spotted Owl. Hybridization has occurred between these 2 species, but occurs so rarely it is now not considered to be a major problem for Spotted Owl management. The Barred Owl may be displacing Spotted Owls, however, because they are more aggressive and adaptable. In the long-term, fragmentation of our old-growth forests may increase the effect of Barred Owl immigration by creating better Barred Owl habitat.

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# Western Screech-Owl

*Otus kennicottii*

## General Description

The Western Screech-Owl is a small, nocturnal, woodland owl of western North America and is one of the west's more common owls at lower elevations. It is the second smallest eared owl, after the Flammulated Owl, found west of the Rocky Mountains. It is a squat-looking owl that sits erect, its plumage fluffed out, with feet and legs obscured, and its distinct ear tufts raised. The iris is bright yellow and this owl will swivel its head into contorted positions to gain a good view because its eyes are immovable. Its bill is black, with tufts of bristly feathers around its base, and toes are yellow. Its plumage is either mainly grayish or reddish-brown (see Morphs) variegated dark and light, that resembles a furrowed tree bark pattern, and is virtually identical to the Eastern Screech-Owl. It has noticeable light spotting along the edge of the scapulars. Its facial disk is bordered by black.

## Size

The Western Screech-Owl is the same size as the Eastern Screech-Owl, about the 12th largest North American owl overall. Because of its puffed plumage it gives the impression of being larger than it is. Females are 5 to 10% larger than males. Females average 9.2 inches (23 centimeters) and males average 8.2 inches (21 centimeters) in length, respectively. Wingspans average 22 inches (56 centimeters) for females and 21 inches (54 centimeters) for males. Weights of different subspecies vary widely, from an average of 6.5 ounces (186 grams) for females and 5.3 ounces (152 grams) for males in a northern population to 4.3 ounces (123 grams) for females and 3.9 ounces (111 grams) for males in a southern population. In general, weights decrease from north to south, with northern rain forest-dwelling birds being as much as 50% heavier than southern desert-dwelling birds.

## Morphs

There are two color morphs, a gray phase and a reddish-brown phase, with much individual variation. In the gray-phase, birds in the dry southwest are a paler gray, while birds in the humid northwest are darker and browner. The red-phase is very rare and is found only in the Pacific Northwest.

## Specific Description

### Adult (gray phase)

- refer to above
- facial disks dusky white with fine gray-brown mottling
- overall gray-brown, with gray-brown narrow vertical stripes, bars, and spots on underparts, and barred wings and tail
- legs fine buff mottling

### Adult (red phase)

- refer to above
- similar pattern to gray phase except dull cinnamon instead of gray
- face buff light cinnamon
- rufous spotting on breast with black anchor marks

### Juvenile (gray and red phases)

- similar to adults but indistinct stripes and bars more patterned
- many feathers tipped with white

## Similar Species

The Western Screech-Owl is likely to be confused mainly with the Eastern Screech-Owl and Whiskered Screech-Owl. These owls can only be distinguished by their different calls. Western and Eastern Screech-Owls only occur together locally in eastern Colorado and southern Texas. Western and Whiskered Screech-Owls only occur together in southern Arizona and Mexico. The Flammulated Owl could be mistaken for this species too, but it is much smaller and darker than the Western Screech-Owl.

## Other Names

It has also been known as Puget Sound Screech-Owl, Washington Screech-Owl, Ghost Owl, Dusk Owl, Little Cat Owl, and Coastal Screech-Owl.

## Etymology

The scientific name *Otus kennicottii* translates into "eared owl named after Robert Kennicott".

## Mythology

Native Northwest coast Kwagulth people believed that owls (including this species) represented both a deceased person and their newly-released soul.

## RANGE

North America - Resident from south-coastal and extreme southeastern Alaska, coastal (excluding Queen Charlotte Islands) and southern British Columbia, northern Idaho, western Montana, northwestern Wyoming, Colorado, extreme western Oklahoma, and western Texas south to Baja California.

Subspecies - There are 8 recognized subspecies of this owl of which 5 are found in North America.

*Otus kennicottii aikeni* - eastern Nevada, Utah, and Colorado south to include most of Arizona, New Mexico, and extreme western Oklahoma.

*Otus kennicottii bendirei* - southeastern Washington, Idaho, and western Montana, most of Nevada south to southern California. This race now includes both *macfarlanei* and *quercinus*. Birds found in southern Alberta are undetermined.

*Otus kennicottii kennicottii* - coastal and extreme southeastern Alaska, British Columbia including Vancouver Island, northern Washington, and coastal Washington and Oregon.

*Otus kennicottii suttoni* - occurs only in the Big Bend area of Texas.

*Otus kennicottii yumanensis* - locally distributed in extreme southeastern California and western Arizona.

The Western Screech-Owl also occurs in Baja California, northern Sinaloa and across the Mexican highlands through Chihuahua and Coahuila as far as the Distrito Federal.

## BEHAVIOR

During direct flight, the Western Screech-Owl flies fairly rapidly with a steady wing beat, about 5 strokes/second. It rarely glides or hovers, but may fly bat-like with erratic movements, when maneuvering through wooded areas. Wings are broad and the head is held tucked in giving a flying bird a stubby appearance.

It hunts at night, from dusk to dawn, before retiring to daytime roosts. It searches for prey mainly while in flight, rather than from a perch. When prey is spotted, the owl dives quickly and seizes it in its talons. It also captures flying insects on the wing. Small prey is usually swallowed whole on the spot. Larger prey is carried in the bill to a perch and then torn apart.

The Western Screech-Owl is essentially non-migratory. Adults tend to remain near their breeding areas year-round while juveniles disperse in the autumn.

Small territories around nest sites are vigorously defended by males. In desert riparian areas of the southwest, where this owl can be quite numerous, territories may be only 165 feet (50 meters) apart. There is no information on territory size in northwestern rain forests. Home ranges are much larger, and range from 7.5 to 150 acres (3 to 60 hectares), but these are not defended and there is much overlap between pairs.

Predators of this owl include Northern Goshawk, Cooper's Hawk, Great Horned Owl, Barred Owl, Spotted Owl, Long-eared Owl, Great Gray Owl, Short-eared Owl, mink, weasels, raccoon, skunks, squirrels, snakes, and crows. Cannibalism by other screech-owls also occurs.

During courtship males and females call, duet-style, as they approach each other. When together they preen each other's heads and nibble at the other's beak. The male then changes his call to a rapid tremolo, answered with a short, tremolo from the female. After a series of these duets, the male copulates with the female.

#### Adaptations

It is the largest and most northerly of all the screech-owls. Uses variegated plumage as camouflage. When threatened, it stretches body and tightens feathers in order to look like a branch stub to avoid detection, but will take flight when it knows it has been detected. Like all owls, it has exceptional hearing, that aids in nocturnal hunting. Its eyes are more adapted for diurnal vision than any other screech-owl. Nests are kept cleaner than in Eastern Screech-Owls. The Western Screech-Owl can be very aggressive and will attack larger owls, other birds, or mammals when protecting nests or defending itself. It can be very tame when handled by humans.

#### HABITAT

The Western Screech-Owl inhabits a wide variety of habitats throughout its range. On the northwest coast, it inhabits humid Douglas-fir, western hemlock, western red cedar, and Sitka spruce forests along the edges of clearings, rivers, and lakes. Further inland it occupies a narrow ecological niche of lowland deciduous forests, especially riparian woodlands along river bottoms. Southern populations inhabit lowland riparian forests, oak-filled arroyos, desert saguaro and cardon cacti stands, Joshua tree and mesquite groves, and open pine and pinyon-juniper forests. It avoids dense forests because Great Horned Owls use that habitat, and high elevation forests. It hunts mainly in open woodlands, along the edges of open fields or wetlands, or makes short forays into open fields. In general it requires open forests, with an abundance of small mammals and insect prey, and cavities for nesting. It roosts mainly in natural or woodpecker cavities in large trees. It will also roost in dense foliage of deciduous trees, usually on a branch next to the trunk, or in dense conifers.

#### VOICE

The male's most common call is a mellow, muted trill "hoo-hoo-hoo...", or bouncing ball song, that speeds up at the end, but maintains a constant pitch. This call differs markedly

from the Eastern Screech-Owl and Whiskered Screech-Owl calls. It is given by the male during the mating and nesting seasons, but also during the autumn and winter. This call is primarily territorial in nature. A secondary song is a double trill of rapid bursts. Other calls are a soft "cr-r-oo-oo-oo-oo" given as a greeting call, and a sharp bark given when excited.

## PELLETS

Pellets are medium-sized, averaging about 1.5 by 0.75 inches (3.8 by 1.9 centimeters). Pellets are compact, dark gray, ovals that are composed of fur, feathers, bones, teeth, and chitin. Two to 4 pellets are cast each day.

## FOODS

An extremely wide range of prey species is captured. Its most favored prey are small microtine rodents and deer mice, larger insects, or small birds depending on abundance. On southern Vancouver Island, it eats mainly small rodents and shrews during the winter, but mainly beetles, larval moths and butterflies, and orthopterans at other seasons. In Washington it eats mainly mice, insects, crayfish, worms, and birds. In Puget Sound, it eats mainly arthropod insects, and birds. In Utah, it favors birds, insects, and small mammals. In California, it eats mainly House Sparrows, pocket gophers, voles, salamanders, and beetles. Further south, it takes kangaroo rats, wood rats, pocket mice, grasshopper mice, gophers, frogs, locusts, and scorpions. Other foods include earthworms, snails, small fishes, frogs, poultry, and barnyard ducks.

## NESTING

The Western Screech-Owl nests almost exclusively in tree cavities. Enlarged natural cavities are preferred but it will also use old Pileated Woodpecker and rotted-out Northern Flicker cavities. Nest cavities are usually 4 to 5 inches (10.2 to 12.7 centimeters) wide and are usually shaded from bright sunlight. Nest cavities are usually 6.5 to 20 feet (2 to 6 meters) above the ground, but may be up to 50 feet (15 meters) up. This owl will readily nest in suitable nest boxes. Nests are almost always in deciduous trees such as oaks, cottonwoods, maples, sycamores and large willows, but also in large cacti, Douglas-fir snags, and junipers. One subspecies in Arizona nests exclusively in saguaro cacti.

No nest material is added. Eggs are laid on natural sawdust on the floor of the cavity. Clutch size ranges from 2 to 5 eggs, averaging 3 to 4 eggs in most areas. The average clutch size tends to increase from south to north and from the coast inland. Eggs are laid every 1 to 2 days and incubation begins after laying of the first egg. The incubation period is about 26 days and the fledging period about 35 days. Females incubate eggs and brood young while males bring food to the nest.

The Western Screech-Owl is single brooded, but may re-nest if first clutches are lost. Pairs will often reuse nest sites in consecutive years. Pairs mate for life but will accept a new mate if the previous mate disappears. Gray and red color phases will mate together.

## CONSERVATION

The Western Screech-Owl is dependent on deciduous woodlands or open mixed forests that have suitable nesting sites (large trees with natural or woodpecker cavities) and sufficient prey densities. Removal of riparian forest in drier regions will cause population declines because most densities are highest in riparian zones. However, this adaptable owl can survive in wooded suburban areas and city parks as long as they are not directly persecuted. Populations likely fluctuate more depending on prey availability.

Nest box programs can enhance local populations, especially in areas short of suitable tree cavities. Silviculture practices that include removal of dead and dying trees can eliminate this bird as a breeding species from local areas. This owl tends to avoid areas inhabited by Great Horned Owls.

The Western Screech-Owl feeds mainly on small rodents and flying insects that are considered injurious to agricultural or forestry crops. Its depredation on songbirds is relatively insignificant because birds comprise a very small percentage of its diet.

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# Whiskered Screech-Owl

*Otus trichopsis*

## General Description

The Whiskered Screech-Owl is a small, nocturnal, woodland owl of southwestern North America and highland Central America. Like all screech-owls, it is a squat-looking owl. The wings, tail, and ear tufts are shorter than other screech-owls, giving a heavier appearance. Its ear tufts are often tilted backwards. The iris is bright yellow. Its bill is pale grayish-yellow to dull greenish, with longish tufts of bristly feathers around its base (the source of its name). Its plumage is either mainly grayish or reddish-brown (see Morphs) variegated dark and light, that resembles a furrowed tree bark pattern, and is very similar to other screech-owls. Its feet are smaller, weaker, and less feathered than other screech-owls.

## Size

The Whiskered Screech-Owl is smaller than other screech-owls, and is the 5th smallest North American Owl overall. Because of its puffed plumage it gives the impression of being larger than it is. Females are 5 to 10% larger than males. Females and males average about 7.0 inches (18 centimeters) in length. Wingspans average 19 inches (48 centimeters) for females and 18 inches (45 centimeters) for males. Weights average 6 ounces (170 grams) for females and 5.6 ounces (161 grams) for males.

## Morphs

There are two color morphs, a gray phase and a reddish-brown phase. Northern populations are entirely gray-phase, but this owl becomes increasingly reddish-brown towards the southern limits of its range.

## Specific Description

### Adult (gray phase)

- refer to above
- similar to other screech-owls but darker than Eastern Screech-Owls and more boldly marked than other screech-owls

### Adult (red phase)

- overall rufous color boldly marked with black shafts and dusky mottling
- grayer than red phase Eastern Screech-Owl

## Juveniles (gray and red phases)

- similar to adults but markings less distinct
- more grayish brown, with many white-tipped feathers

## Similar Species

The Whiskered Screech-Owl is only likely to be confused with the Western Screech-Owl. These owls can only be distinguished by their different calls, but only occur together locally in Arizona and northern Mexico. Another eared owl, the Flammulated Owl, is much smaller and darker.

## Other Names

It has also been known as Spotted Screech-Owl, Whiskered Owl, and Arizona Whiskered Owl.

### Etymology

The scientific name *Otus trichopsis* translates into "eared owl with hairy appearance".

### Mythology

No information.

### RANGE

North America - Resident only in southeastern Arizona.

Subspecies - There are 3 recognized subspecies of this owl of which 1 occurs in North America.

*Otus trichopsis aspersus* - occurs in southeastern Arizona.

The Whiskered Screech-Owl also occurs in Mexico and Central America.

### BEHAVIOR

During direct flight, the Whiskered Screech-Owl flies fairly rapidly with a steady wing beat, usually low to the ground. At the end of a flight it swoops up to a perch. It rarely glides or hovers, but flutters about the tops of trees when searching for prey. Wings are broad and the head is held tucked in giving a flying bird a stubby appearance.

It hunts at night, from dusk to dawn. It is a "sit and wait" predator, scanning for prey from perches. It makes short flights from perch to perch or to the ground. During the summer it is mainly an aerial feeder, taking flying insects. Insects are carried in the beak. It also gathers invertebrates from leaves and branches. Because it is a smaller owl, it tends to rip prey apart more than other screech-owls.

The Whiskered Screech-Owl is a sedentary owl. There is no need to migrate because insects are plentiful year-round. In Arizona, the northern limit of its range, movements to lower altitudes probably occur during winter.

Little information exists on breeding territory or home ranges. Breeding territories are thought to be about 1,000 feet (300 meters) in diameter. Territories are vigorously defended by males, but pairs may nest within 165 feet (50 meters). Breeding territories range from 10 to 15 acres (4-6 hectares) in wooded suburban areas to 75 acres (30 hectares) in more open rural areas. Home ranges are much larger, up to 200 acres (0.8 square hectares), but these are not defended and there is much overlap between pairs.

There are no data on longevity. Captive owls have lived over 10 years, but wild birds would be less likely to reach this age. Predators of this owl include Great Horned Owls, Long-eared Owls, and Barn Owls. This owl is plagued by Mallophaga lice. Cannibalism by other screech-owls also occurs.

Courtship behavior is elaborate. The male feeds the female through the night, then approaches to copulate. After a period of duetting, the male mounts the female and she gives her catlike call. Copulation is followed by mutual preening and bill-nibbling.

## Adaptations

Its smaller size compared to other screech-owls is thought to be an adaptation for maneuverability in denser forests. Its small feet are better able to grasp insects and small twig perches, than larger feet.

Uses variegated plumage as camouflage. When perched on a thick branch, it puffs its feathers and leans forward to mimic a limb bulge. When perched further out on a branch, it tilts its body to resemble a leaf cluster.

Like all owls, it has exceptional hearing, that aids in nocturnal hunting, but it also has good daytime vision.

The Whiskered Screech-Owl can be very aggressive and will attack larger owls, other birds, or mammals when protecting nests or defending itself, but is less pugnacious than other screech-owls. It can be very tame when handled by humans.

## HABITAT

The Whiskered Screech-Owl inhabits denser forest and higher altitudes than other screech-owls, typically frequenting montane oak and pine-oak forests between 4,000 to 7,000 feet (1,200 to 2,100 meters) elevation. It is usually found on mountain slopes, canyons, and higher valley bottoms. In Arizona it occurs down into dense oak forests. In southern Mexico it reaches the lower cloud forests and also nests in coffee plantations and partially logged areas. In Arizona and northern Mexico it co-exists with Western Screech-Owls and Flammulated Owls at about 5,500 feet (1,700 meters) elevation.

It roosts mainly on an oak, sycamore, or juniper branch next to the trunk.

## VOICE

The most distinctive call is the territorial call of the male, a rapid (4 to 8 notes/second) "hoot-hoot-hoot-hoot-HOOT-hoot". This call is often given near dusk during territory establishment and the mating season. A syncopated trill is given by both sexes, often as a duet, during copulation or food delivery by the male. The female utters a catlike "chang" note during copulation and when she is waiting for food. It also snaps its bill audibly and barks when disturbed. In autumn it gives a soft "hoo-oo" just after sunset.

## PELLETS

Pellets are small, loosely formed, and disintegrate rapidly. Pellets contain mainly insect body parts (chitinous fragments), with little hair or bone to keep them together.

## FOODS

This screech-owl is almost entirely insectivorous. There is only one record of a vertebrate (mouse) in its diet. Most frequently captured prey are arthropods, mainly orthopterans (crickets, grasshoppers, mantids), adult beetles, and moths. Other prey includes spiders, centipedes, scorpions, leafhoppers, beetle larvae, and various caterpillars. Most prey are about 0.63 inches (15 millimeters) in length but range from 0.25 to 3 inches (6 to 75 millimeters). They probably also take the occasional small bird and rodent more frequently than presently known.

## NESTING



The Whiskered Screech-Owl nests almost exclusively in tree cavities, but cavities are usually in large branches or stubs rather than in the main trunk. Enlarged natural cavities are preferred but it will also use old Northern Flicker cavities. Trees used include oaks, sycamores, walnuts, and junipers. Nest cavities are usually 10 to 20 feet (3 to 6 meters) above the ground, and are rarely more than 30 feet (9 meters) up. Fewer nests have been found than for any other North American owl. All known nests have been found between 5,400 to 6,400 feet (1,650 to 1,950 meters) elevation.

Most nests contained a few oak leaves, probably swept inside by winds. Clutch size ranges from 3 to 4. There are no data on incubation or fledging periods but are likely similar to other screech-owls, about 26 days and 31 days, respectively.

The Whiskered Screech-Owl is single brooded, but may re-nest if first clutches are lost. Pairs will often reuse nest sites in consecutive years. Thought to mate for life but will accept a new mate if the previous mate disappears.

#### CONSERVATION

The Whiskered Screech-Owl is dependent on dense montane forests throughout their range. Large-scale timber harvesting will inevitably lead to population declines. There is no information available on use of nest boxes but it would likely readily take to nest boxes as do the other screech-owls. This owl may be outcompeted for territories by the smaller Northern Saw-whet Owl. It is largely beneficial to man because it eats insects that are injurious to crops or forests.

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# Long-eared Owl

*Asio otus*

## General Description

The Long-eared Owl is a medium-sized, nocturnal, woodland owl, with a broad distribution across North America. It is a slender-looking owl, that slouches forward when perched, and has prominent ear tufts that appear to sit in the middle of the head and are usually held erect. Its plumage is brown and buff, with heavy mottling and barring over most of its body. It has golden yellow eyes, encircled by black feathers, that are set in orange-brown facial disks. The bill is black. Its eyes seem to "stare" intensely when looking at something. The forehead and lores are mottled gray and white and it has a white chin patch. Its legs and feet are heavily feathered.

## Size

The Long-eared Owl is the eighth largest owl in North America. It is midrange in size for "eared" owls between the Great Horned Owl and screech-owls. Females are about 10% larger than males. Lengths average 14.6 inches (37 centimeters) for females and 13.4 inches (34 centimeters) for males. Wingspans average 39 inches (100 centimeters) for females and 38 inches (96 centimeters) for males. Weights average 10 ounces (282 grams) for females and 9 ounces (259 grams) for males.

## Specific Description

### Morphs

The Long-eared Owl is monotypic with little geographic variation in plumage. Male plumage tends to be lighter than females.

### Adult

- refer to above
- erect ear tufts that seem relatively close together and appear to sit on the middle of the head above the eyes.
- slender profile and heavily mottled plumage

### Juvenile

- similar to adults but less heavily marked
- head tufts are shorter and less defined
- facial disks are darker than adults
- body feathers tipped with grayish white

## Similar Species

The Long-eared Owl is similar in size to the Short-eared Owl but has obvious ear tufts and is rarely seen during the day. The Great Horned Owl has a similar overall plumage pattern but is much larger and more powerful-looking. Screech-owls are much smaller and squatter-looking. The latter two species also have tufts that appear to sit on the outside of the eyes.

## Other Names

It has also been known as American Long-eared Owl, Brush Owl, Cat Owl, and Lesser Horned Owl.

## Etymology

The scientific name *Asio otus* translates into "horned owl".

## Mythology

No information available

## RANGE

North America - Breeds from central and southern British Columbia (excluding Vancouver Island), southeastern Yukon, southwestern Mackenzie, northern Saskatchewan, central Manitoba, central Ontario, southern Quebec, New Brunswick, Prince Edward Island and Nova Scotia south to southern California, southern Arizona, southern New Mexico, northern Texas, Oklahoma, northwestern Arkansas, central Missouri, central Illinois, central Indiana, central Ohio to New York and south to Pennsylvania and mountainous areas of western Virginia. Northern populations move southward into the central United States where they are present year-round.

Winters from southern Canada south to southern Texas, the Gulf coast and infrequently Florida.

Subspecies - There are 2 recognized subspecies of this owl in North America.

*Asio otus tuftsi* - Resident from southern Mackenzie, southern Yukon, and British Columbia east to Saskatchewan, and south to southern California and western Texas.

*Asio otus wilsonianus* - occurs year-round from southern Manitoba east to Nova Scotia, and south to northern Oklahoma and Virginia.

The Long-eared Owl is also widely distributed in Eurasia and northern Africa.

## BEHAVIOR

The Long-eared Owl is a buoyant flier, appearing to glide noiselessly even when its wings are flapping. It is very maneuverable and can fly through fairly dense brush. It flies moth-like, often hovering and fluttering while looking for prey.

The Long-eared Owl hunts mainly by ranging over open rangeland, clearings, and fallow fields. It rarely hunts in woodlands where it roosts and nests. This owl hunts mainly from late dusk to just before dawn. It flies low to the ground, 3 to 7 feet (1 to 2 meters up, with its head canted to one side listening for prey. When prey is spotted it darts to the spot and pounces immediately, pinning the prey to the ground with its powerful talons. It rarely catches birds on the wing, but will take them on the ground or in low bushes. Smaller prey is usually swallowed immediately, or carried away in the bill. Larger prey is carried in the talons.

Northern populations are highly migratory, moving south in mid autumn and north again in March. Southern populations tend to be sedentary. Significant east/west dispersal may occur as well; a bird banded in California in the spring was captured the next fall in Ontario. Nesting territories are defended from other Long-eared Owls but foraging areas may overlap. Densities of breeding birds are relatively low, except when local food and nesting habitat availability allow loosely colonial nesting. Along the Columbia River, there is about 1 pair per 7 miles (12 kilometers of riparian habitat. In Wyoming, breeding season home ranges average 135 acres (55 hectares. Unlike most other owls, during winter this owl may roost

communally (7 to 50 birds) in dense thickets and range over very large undefended foraging areas. Communal roost sites are often used year after year, probably by the same birds.

This is a long-lived owl with captive owls of over 10 years being known. There is little information on mortality, but many birds are killed by shooting and collision with vehicles. Natural enemies of adult birds include Great Horned and Barred owls. Males occupy nesting territories first and may begin their territorial calling in winter. During the height of courtship, males perform display flights around nests. Display flights involve erratic gliding and flapping through the trees with occasional single wing claps. Females respond by giving their nest call. The female selects a nest by hopping around it, while the male displays above. She then performs display flights as well, and flies repeatedly to the nest. Leading up to copulation, the male approaches the female after calling and performing display flights, then waves his wings as he sidles up to her. Mutual preening and courtship feeding also occur.

After pairing, adults roost close together, but the female tends to roost on the nest after it has been selected.

The Long-eared Owl has an impressive nest defense display, whereby the female spreads her wings out widely facing the intruder, flares her flight feathers, and lowers her head. This display makes her appear 2 to 3 times as large as she really is. The Long-eared Owl also performs a distraction displays near nests, where it pretends to capture prey, or feign injury, and flop away from the nest on the ground making various noises. It occasionally attacks viciously, aiming its talons at the face and throat of the intruder. When roosting it will stretch its body to make itself appear like a tree branch.

#### Adaptations

Its eyes are best adapted for hunting in late evening and early morning, but uses hearing as its primary method of locating prey. The strongly marked plumage is well-camouflaged when it roosts in dense foliage during the day. It typically roosts relatively low to the ground, 13 to 26 feet (4 to 8 meters) up. During cold weather it roosts lower; when hot it roosts higher up.

#### HABITAT

The Long-eared Owl inhabits open woodlands, forest edges, riparian strips along rivers, hedgerows, juniper thickets, woodlots, and wooded ravines and gulleys. Breeding habitat must include thickly wooded areas for nesting and roosting and nearby open spaces for hunting. During winter, it needs dense conifer groves or brushy thickets to roost in. Roosting sites are usually in the heaviest forest cover available. It will also roost in hedgerows, or in caves and cracks in rock canyons.

#### VOICE

The primary advertisement call of the male is a low "hoo, hoo, hoo, hoo, .....", repeated 10 to 200 times, with one note very 2 to 3 seconds. The female responds with a raspy buzz nest call, and often duets with the male. Calling occurs almost always during nocturnal hours. When alarmed, Long-eared Owls bark "whkek-WHEK-whkek" or shriek like a cat. Both sexes hiss during exchange of prey and when alarmed.

#### PELLETS

Pellets are fairly large, about 2 inches (5.1 centimeters) long and 0.75 inches (1.9 centimeters) thick. Pellets are oval or cylindrical, grayish, and compact with numerous

bones, skulls, and teeth. Pellets are regurgitated 3 to 4 hours after eating.

## FOODS

The Long-eared Owl feeds mainly on mammals. In most areas voles are the primary prey, but deer mice are the most important prey in other areas. In southwestern deserts, pocket mice and kangaroo rats are primary foods. Other mammal prey includes squirrels, bats, chipmunks, gophers, shrews, moles, and cottontail rabbits. This owl rarely takes birds and most of these are smaller species that occur on or near the ground. Bird prey includes meadowlarks, blackbirds, juncos, Horned Larks, doves, bluebirds, and thrashers. Larger birds such as grouse and screech-owls are occasionally taken. This owl rarely takes insects, frogs, and snakes.

## NESTING

The Long-eared Owl nests almost exclusively in old stick nests of crows, magpies, ravens, hawks, or herons. American Crow nests provide the majority of nest sites. It nests rarely in rock crevices, tree cavities, builds its own sloppy stick nest, or on open ground. Nests are almost always located in wooded sites, often screened by shrubbery, vines, or branches and are commonly 16 to 33 feet (5 to 10 meters) above ground. Nesting occurs mainly from mid March through May.

Old nests are lined with bark strips, feathers, leaves, and moss before eggs are laid. Clutch size ranges from 3 to 8 eggs, with an average of 4 to 5 eggs. Clutch sizes tend to increase from south to north and from east to west. Eggs are laid irregularly every 1 to 5 days and incubation begins with the first egg laid, so that a clutch of 6 eggs may hatch over a period of 10 to 12 days. The female performs most of the incubation but the male may incubate for short intervals while the female hunts. The incubation period is 25 to 30 days. Nestlings begin to walk out of the nest onto nearby branches at about 3 weeks, but are not capable of flight until about 5 weeks. Young become independent from parents at about 2 months. Nesting success is strongly linked to food availability and predation. Raccoons are major predators of eggs and nestlings.

The Long-eared Owl is single-brooded. Replacement clutches are laid about three weeks after the first clutch is lost.

## CONSERVATION

Populations fluctuate regularly with prey abundance. Overall populations are thought to be declining in North America because of the loss of riparian nesting habitat through urban and agricultural development. Pesticide use may have secondary effects on Long-eared Owls. Useful habitat enhancements include retention of fallow fields, elimination of vast monocultures, decreased use of pesticides, and planting of conifer groves.

The Long-eared Owl is very beneficial to man because of the high percentage of rodents in its diet.

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## **Agricultural Lands**

Clearing of the forest and planting crops is a habitat that some species of birds have recently been able to successfully invade. Short grass hayfields provide food and cover for many small mammals such as voles and mice while wooden silos and barns provide suitable nesting sites for some owls.

The primary user of this habitat is the Barn Owl although the Short-eared Owl also nests and forages here.

## **Arctic Tundra**

The Arctic Tundra extends beyond the tree line in the far northern regions of North America. It is characterized by low temperatures, low precipitation, and a short growing season. Plant growth from here is low and growth is slow. Typical vegetation is cotton grass, sedges, dwarf heaths, and small willows.

Only the Snowy Owl, occurs in this habitat year-round.

The owls that inhabit the Arctic tundra are:

Short-eared Owl

Snowy Owl



## **Coniferous Forests**

This type of forest occurs across the continent as a wide belt extending from New England and southern Canada northward to the Arctic Tundra, westward to the Pacific coast, and southward through the Rocky and Sierra mountains. In some areas a single conifer, such as a ponderosa pine, dominates the vegetation. Coniferous forests may be composed of pines in the east, black spruce in the north, redwoods in the southwest, or Sitka spruce in the west.

Seven species occur in these forests. These include the Flammulated Owl, Great Horned Owl, Northern Hawk Owl, Northern Pygmy-Owl, Barred Owl, Boreal Owl and Great Gray Owl.

## **Desert**

Deserts are harsh environments that are arid with high temperatures. Shrubs and cacti dominate desert plant life. Two kinds of desert occur in North America. In the cool deserts of the Great Basin sagebrush dominates the land while in the hot southwest creosote bush and cacti dominate the landscape.

Only the Elf Owl breeds primarily in this habitat.

## **Deciduous Woodlands**

North America is rich in deciduous or hardwood forests. Most are found in regions with moderate rainfall and mild temperatures which are requirements for the spring growing season. These woodlands are usually dominated by a single tree species like sugar maple, alder, trembling aspen, magnolia, yellow poplar, black cottonwood, or an oak.

The Eastern Screech-Owl is the primary year-round user of this habitat although the Great Horned Owl and the Long-eared Owl are also found here.

## **Grasslands**

Grasslands, which once covered large areas of the midcontinent of North America, have shrunk greatly due to man's needs for agricultural and grazing lands. They consist of bunch grasses and sod formers which provide nesting sites for many birds. Insects and small mammals occur in great abundance. The prairie dog is one of the common burrowing mammals.

The burrowing Owl and Short-eared Owl primarily use this habitat.

## **Mixed Coniferous / Deciduous Forests**

These forests are the most diverse in animal life because they provide the greatest range of food, cover, and protection. For example, trembling aspen, which is the most widespread tree in North America, when interspersed in coniferous forests, provides home for such animals as deer, grouse, bear, snowshoe hare, and beaver. Some northern forests contain mixtures of pine, hemlock, and an assortment of hardwoods.

Five species occur regularly in this habitat. These are the Great Horned Owl, Barred Owl, Great Gray Owl, Boreal Owl, and Northern Saw-whet Owl.

## **Mixed Coniferous Forests**

Within the coniferous belt occurs large stands of mixed conifers. On the Pacific coast these may include associations of Douglas-fir, western red cedar, and western hemlock while in the east assorted combinations of several species of pines, white cedars, and hemlocks may be found together. As a rule these kinds of forests support a greater variety of birds than do coniferous forests.

This habitat supports the most species of owls. These include Flammulated Owl, Western Screech-Owl, Whiskered Screech-Owl, Great Horned Owl, Northern Hawk Owl, Spotted Owl, Boreal Owl, and Northern Saw-whet Owl.

## **Mixed Deciduous Woodlands**

These forests occur mainly on glaciated land which has deep, rich layers of soil. Usually two or more kinds of deciduous trees dominate the area. These might include associations of beech-sugar maple or sugar maple-basswood typical in the East or black cottonwood, red alder, and birch-poplar-cottonwood in the West.

Six species inhabit these woodlands. These include the Western Screech-Owl, Great Horned Owl, Northern Pygmy-Owl, Ferruginous Pygmy-Owl, Long-eared Owl, and Northern Saw-whet Owl.

## **Shrublands**

Shrublands are a stage in the land's progress back to a forest environment. They rarely cover the land entirely but appear as scattered plants or clumps of brush situated in grasslands, on the sides of hills, along streams, around lakes, and in wet areas. In some places they form dense thickets. Typical shrubs include hazelnut, sumac, some dogwoods and willow, chokecherry, alder, red-osier dogwood, and hawthorne.

Only the Long-eared Owl breeds and winters principally in this habitat.



## **Burrows**

These holes in the ground are usually the abandoned burrows of mammal-digging species like badger, skunk, prairie dog, marmot, fox, or dog. Rarely do owls excavate their own nest site. Burrows are situated in banks, levees, flat terrain, and sides of ditches. A large nest chamber, where the eggs are laid is at the end of a 5 to 10 foot tunnel. The chamber is lined with leaves, pieces of horse and cow dung, snake skins, and other grassland debris.

Only one species, the Burrowing Owl, primarily uses this type of nest.

## **Cactus cavities**

These nest sites occur in large cacti in desert habitats. Woodpeckers, such as the Northern Flicker, Gila Woodpecker, and Acorn Woodpecker excavate their own nests in these desert plants but later abandon them for new nests. These old cavities are used by a variety of animals.

The tiny Elf Owl is the primary occupant of cactus cavities.

## **Stick - domes**

These large, bulky stick nests may be four feet tall and three feet wide and are usually abandoned nests of the Black-billed Magpie. They may be found in dense thickets, shrubby areas, deciduous groves, and copses, and some coniferous stands.

In certain parts of its range only the Long-eared Owl depends heavily on abandoned stick - dome nests to raise its family.

## **Ground**

These are open nests that usually consist of slight depressions in the ground. They are often found near grass clumps or bushes in fields, pastures, prairies, marshes, dunes, or tundra environments. Nest materials are usually sparse and consist of a few grasses, sticks, weed stalks, feathers, leaves, mosses, and lichens.

The Snowy Owl and Short-eared Owl are the primary ground-nesting species and are unique in that they are two of the few owls to construct their own nest.

## **Human made**

These nest types include large human-made structures such as barns, silos, church steeples, duck blinds, old mine shafts, abandoned wells, and other abandoned buildings. Nests are usually on some platform or ledge that is out of direct light.

It should also be noted that most species of owls will also nest in wooden boxes or platforms erected especially for them.

Today, only the Barn Owl is primarily interested in human-made nest sites.

## **Stick - Platforms**

These bulky platform nests are usually built of sticks and twigs and may be located in trees far out on a branch or in a crotch next to the trunk. Deciduous and coniferous trees, as well as tall dense shrubs, are used. These sites are almost always located in the abandoned nests of hawks, crows, ravens, or herons. Very little if any additional material is added by the owls.

Five species prefer these sites although their preference varies geographically. These include the Great Horned Owl, Northern Hawk Owl, Barred Owl, Great Gray Owl, and Long-eared Owl.

## **Snags and stumps**

These nests are usually located in the rotted out tops of snags and stumps. The sites may be in either coniferous or deciduous trees. Sometimes natural breaks and cracks caused by lightning, winds, or ice-storms are used. Usually the hollow in the top of the tree stub provides some protection for the eggs and young. Usually no nesting materials are added to the nest site other than debris and wood chips already present.

The Spotted Owl, Barred Owl, and Great Gray Owl are the primary users of this nest type.

## **Centipedes**

The owls that frequently hunt centipedes are:

Burrowing Owl

Whiskered Screech-Owl



## **Scorpions**

The owls that frequently hunt scorpions are:

Elf Owl

Ferruginous Pygmy-Owl

Whiskered Screech-Owl

## **Spiders**

The owl that frequently hunts spiders is:  
Elf Owl

## **Grasshoppers**

The owls that frequently hunt grasshoppers are:

Burrowing Owl

Ferruginous Pygmy-Owl

Flammulated Owl

Whiskered Screech-Owl

## **Moths**

The owl that frequently hunts moths is:  
Flammulated Owl

## **Dragonflies**

The owl that frequently hunts dragonflies is:  
Burrowing Owl

## **Birds**

The owls that frequently hunt birds are:

Barred Owl

Boreal Owl

Burrowing Owl

Great Horned Owl

Northern Hawk Owl

Northern Pygmy-Owl

Snowy Owl

Western Screech-Owl

## **Squirrels**

The owls that frequently hunt squirrels are:

Barred Owl

Great Gray Owl

Northern Hawk Owl

Snowy Owl

Spotted Owl

## **Rats**

The owls that frequently hunt rats are:

- Barn Owl
- Barred Owl
- Eastern Screech-Owl
- Great Gray Owl
- Short-eared Owl
- Spotted Owl



## **Mice**

The owls that frequently hunt mice are:

- Barn Owl
- Barred Owl
- Boreal Owl
- Eastern Screech-Owl
- Great Gray Owl
- Long-eared Owl
- Northern Saw-whet Owl
- Short-eared Owl
- Spotted Owl
- Western Screech-Owl

## **Voles**

The owls that frequently hunt voles are:

- Barn Owl
- Barred Owl
- Boreal Owl
- Long-eared Owl
- Northern Hawk Owl
- Northern Pygmy-Owl
- Northern Saw-whet Owl
- Short-eared Owl
- Snowy Owl

## **Rabbits**

The owls that frequently hunt rabbits and hares are:

Great Horned Owl

Long-eared Owl

## **Skunks**

The owl that frequently hunts skunks is:  
Great Horned Owl

## **Chipmunks**

The owl that frequently hunts chipmunks is:  
Long-eared Owl

## **Weasels**

The owl that frequently hunts weasels is:  
Northern Hawk Owl

## **Tree cavities**

These may occur as natural or excavated nest sites. Natural cavities may be created by wind or ice-storms or from natural aging of fallen branches or split trunks. Excavated sites are usually abandoned cavities of woodpeckers such as the Pileated Woodpecker, Northern Flicker, Gila Woodpecker, Acorn Woodpecker, Three-toed Woodpecker, and sapsuckers. Such cavities may be found in coniferous and deciduous trees and other large plants. In both natural and excavated nest types no additional nesting material is used other than what is present in the cavity.

This nest type is used as a primary site by more owls than any other. The 9 species that utilize tree cavities include Flammulated Owl, Eastern Screech-Owl, Western Screech-Owl, Whiskered Screech-Owl, Northern Hawk Owl, Northern Pygmy-Owl, Ferruginous Pygmy-Owl, Boreal Owl, and Northern Saw-whet Owl.

# Eastern Screech Owl - Gray Phase

*Otus asia*

## General Description

The Eastern Screech-Owl is a small, nocturnal, woodland owl of eastern North America and is one of our more common owls. It is the smallest eastern owl next to the Northern Pygmy-Owl and is the smallest eared owl found east of the Rocky Mountains. It is a squat-looking owl that sits erect, its plumage fluffed out, with feet and legs obscured, and its distinct ear tufts raised. The iris is bright yellow and this owl will swivel its head into contorted positions to gain a good view because its eyes are immovable. Its bill is gray-green, with tufts of bristly feathers around its base, and toes are yellow. Its plumage is either mainly grayish or reddish-brown (see Morphs) variegated dark and light, that resembles a furrowed tree bark pattern. Its facial disk is bordered by black.

## Size

The Eastern Screech-Owl is the 12th largest North American owl overall. Because of its puffed plumage it gives the impression of being larger than it is. Females are 5 to 10% larger than males. Females average 9.2 inches (23 centimeters) and males average 8.2 inches (21 centimeters) in length, respectively. Wingspans average 22 inches (56 centimeters) for females and 21 inches (54 centimeters) for males. Weights average 7.3 ounces (208 grams) for females and 7.0 ounces (200 grams) for males.

## Morphs

There are two color morphs, a gray phase and a reddish-brown phase.

## Specific Description

### Adult (gray phase)

- refer to above
- facial disks dusky white with fine gray-brown mottling
- overall gray-brown, with gray narrow vertical stripes, bars, and spots on underparts, and barred wings and tail
- legs light cinnamon buff

### Adult (red phase)

- refer to above
- similar pattern to gray phase except cinnamon instead of gray
- face plain light cinnamon
- whitish superciliary and loreal plumage

### Juvenile (gray phase)

- similar to adults but indistinct stripes and bars more patterned
- many feathers tipped with white

### Juvenile (red phase)

- grayish brown, but distinctly rufescent color overall
- bars and stripes less distinct than adults

## Similar Species

The Eastern Screech-Owl is only likely to be confused with the Western Screech-Owl.



These owls can only be distinguished by their different calls, but only occur together locally in eastern Colorado and southern Texas.

#### Other Names

It has also been known as Ghost Owl, Dusk Owl, Little-eared Owl, Mouse Owl, Shivering Owl, Spirit Owl, Little Dukelet, Texas Screech-Owl, and Red Owl.

#### Etymology

The scientific name *Otus asio* translates into "eared owl" or "horned owl".

#### Mythology

Cherokee shamans valued Eastern Screech-Owls as consultants as the owls could bring on sickness as punishment. Oto-Missouris thought that if you heard a screech-owl call, then death is going to occur. Louisiana Cajuns thought you should get up from bed and turn your left shoe upside down to avert disaster, if you heard one calling late at night.

#### RANGE

North America - Resident from extreme southeastern Alberta, southern Saskatchewan, southern Manitoba, northern Minnesota, northern Michigan, southern Ontario, southwestern Quebec, and Maine south through the eastern United States, northeastern Montana, eastern Wyoming, northeastern Colorado, Kansas, western Oklahoma, and west-central Texas. May breed in central Alberta.

Subspecies -There are 9 recognized subspecies of this owl of which 5 occur in North America.

*Otus asio asio* - occurs in Minnesota, peninsular Michigan, southern Quebec, and southern Maine south to Missouri and northern parts of Mississippi, Alabama, and Georgia.

*Otus asio floridanus* - occurs in Florida and west along the Gulf Coast to Louisiana and north to Arkansas.

*Otus asio hasbroucki* - occurs from central Kansas to Oklahoma and Texas.

*Otus asio maxwelliae* - occurs from southeastern Alberta, southern Saskatchewan, southern Manitoba, eastern Montana, and the Dakotas south to eastern Montana, western Nebraska, western Kansas, and northeastern Colorado.

*Otus asio mccallii* - occurs locally only in the Lower Rio Grande of Texas.

The Eastern Screech-Owl also occurs in Mexico.

#### BEHAVIOR

During direct flight, the Eastern Screech-Owl flies fairly rapidly with a steady wingbeat, about 5 strokes/second. It rarely glides or hovers, but may fly bat-like with erratic movements, when maneuvering through wooded areas. Wings are broad and the head is held tucked in giving a flying bird a stubby appearance.

It hunts at night, from dusk to dawn, but most hunting is done during the first four hours of darkness. It searches for prey mainly while in flight, rather from a perch. When prey are spotted, the owl dives quickly and seizes it in its talons. It also captures flying insects on the wing. Small prey is usually swallowed whole on the spot. Larger prey is carried in the bill to a perch and then torn apart. This owl tends to frequent areas in its home range where it hunted successfully on previous nights. It is an opportunistic hunter and will switch to

almost any suitably-sized prey when abundant. It has even been observed fishing at holes in lake ice left by ice fishers or at open pockets of water.

The Eastern Screech-Owl is essentially non-migratory except when severe food shortages or severe winters force some populations to move southward. Adults tend to remain near their breeding areas year-round while juveniles disperse in the autumn. Siblings tend to disperse together.

Small territories around nest sites are vigorously defended by males, but pairs may nest within 164 feet (50 meters). Breeding territories range from 10 to 15 acres (4 to 6 hectares) in wooded suburban areas to 75 acres (30 hectares) in more open rural areas. Home ranges are much larger, up to 200 acres (80 hectares), but these are not defended and there is much overlap between pairs.

Captive owls have lived over 20 years, but wild birds would be unlikely to reach this age. Juvenile and adult mortality may reach as high as 70% and 30% respectively. Predators of this owl include Great Horned Owls, Barred Owls, Long-eared Owls, Great Gray Owls, Short-eared Owls, Snowy Owls, mink, weasels, raccoons, skunks, snakes, crows, and Blue Jays. Cannibalism by other screech-owls also occurs. Eastern Screech-Owls are the second most frequently killed bird by moving vehicles, after American Robins.

Courtship behavior is elaborate. Males approach females, calling from different branches until they are close. The male then bobs and swivels head, bobs entire body, and even slowly winks one eye at the female. If she ignores him, bobbing and swiveling motions intensify. If she accepts him, she moves close and they touch bills and preen each other.

#### Adaptations

Uses variegated plumage as camouflage. When threatened, it stretches body and tightens feathers in order to look like a branch stub to avoid detection, but will take flight when it knows it has been detected. In open roosts, gray-phase birds tend to roost next to a tree trunk, whereas red-phase birds tend to roost in outer foliage, possibly because of thermal requirements.

Like all owls, it has exceptional hearing, that aids in nocturnal hunting.

It preens often and readily uses bird baths, but nests are often filled with pellets, prey remains, etc.

The Eastern Screech-Owl can be very aggressive and will attack larger owls, other birds, or mammals when protecting nests or defending itself. It can be very tame when handled by humans.

#### HABITAT

The Eastern Screech-Owl inhabits open mixed woodlands, deciduous forests, parklands, wooded suburban areas, riparian woods along streams and wetlands (especially in drier areas), mature orchards, and woodlands near marshes, meadows, and fields. It avoids dense forests because Great Horned Owls use that habitat, and high elevation forests. It hunts mainly in open woodlands, along the edges of open fields or wetlands, or makes short forays into open fields.

It roosts mainly in natural cavities in large trees, including cavities open to the sky during dry weather. In suburban and rural areas it may roost behind loose boards on buildings, boxcars, or water tanks. It will also roost in dense foliage of trees, usually on a

branch next to the trunk, or in dense scrubby brush.

## VOICE

Males have a lower-pitched voice than females. The male's most common call is an eerie, mellow, muted trill "hoo-hoo-hoo....", or bouncing song, that rises in pitch, before sliding down again. This call is given by the male during the mating and nesting seasons, each call lasting 2 to 3 seconds with about 35 notes given, and repeated at various intervals. This call is primarily territorial in nature and announces ownership of nest cavities. When young are in the nest, adults give a descending whinny call, rather than the bouncing call. This call is given through the winter until the mating call begins again. Females tend to bark or hoot when defending broods. Young "peep" for food during their first three weeks, then chatter or hum later. Fledglings demand food by a harsh "keeeerr-r-r-r". It does not call while in flight, except when alarmed.

## PELLETS

Pellets are medium-sized, averaging about 1.5 by 0.75 inches (3.8 by 1.9 centimeters). Pellets are compact, dark gray, ovals that are composed of fur, feathers, bones, teeth, and chitin. Two to 4 pellets are cast each day.

## FOODS

An extremely wide range of prey species is captured. Its most favored prey is small microtine rodents and deer mice. Other mammals taken include wood and Norway rats, chipmunks, cotton rats, squirrels, shrews, bats, and moles. Large flying insects such as beetles, katydids, grasshoppers, locusts, crickets, mantids, roaches, cicadas, moths, horseflies, and dragonflies are readily taken. Birds comprise about 7% of its diet and include many species of small songbirds but also larger birds such as Northern Bobwhite, Rock Dove, Ruffed Grouse, and other screech-owls. Birds may be captured more often during periods of heavy songbird migration. Other prey include small fish, small snakes, lizards, and soft-shelled turtles, small frogs, toads, and salamanders, and invertebrates such as crayfish, snails, spiders, earthworms, scorpions, and centipedes.

## NESTING

The Eastern Screech-Owl nests almost exclusively in tree cavities. Enlarged natural cavities are preferred but it will also use old Pileated Woodpecker and Northern Flicker cavities. Nest cavities are usually 4 to 5 inches (10.2 to 12.7 centimeters) wide and are usually shaded from bright sunlight. Nest cavities are usually 6.5 to 20 feet (2 to 6 meters) above the ground, but may be up to 50 feet (15 meters) up. This owl will readily nest in suitable nest boxes and occasionally behind loose boards on abandoned buildings or barns. Nests are almost always in deciduous trees such as oaks, elms, maples, sycamores, willows, and apples; occasionally in pines.

No nest material is added. Eggs are laid on natural sawdust on floor of cavity. Clutch size ranges from 2 to 8 eggs, averaging 3 to 5 eggs in most areas. The average clutch size increases from south to north and from east to west. Eggs are laid every two days and incubation begins after laying of the first egg. The incubation period is about 26 days and the fledging period about 31 days. Females do most of the incubating but males will assist.

The male provides most of the food while the female broods young, and stockpiles food during early stages. When young are small the female rips up food for them.

Eastern Screech-Owls are single brooded, but may re-nest if first clutches are lost. Pairs

will often reuse nest sites in consecutive years. Pairs mate for life but will accept a new mate if the previous mate disappears. Gray and red color phases will mate together.

## CONSERVATION

The Eastern Screech-Owl is dependent on open deciduous woodlands that have suitable nesting sites (large trees with natural or woodpecker cavities) and sufficient prey densities. Urbanization has caused local declines in heavily developed areas of eastern North America. Removal of riparian forest in drier regions will cause population declines because most habitat is confined to riparian zones. However, this adaptable owl can survive in wooded suburban areas and city parks as long as they are not directly persecuted. Populations likely fluctuate more depending on prey availability.

Nest box programs can enhance local populations, especially in areas short of suitable tree cavities.

The Eastern Screech-Owl feeds mainly on small rodents and flying insects that are considered injurious to agricultural or forestry crops. Its depredation on songbirds is relatively insignificant because birds comprise a very small percentage of its diet.

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# Eastern Screech-Owl - Red Phase

*Otus asia*

## General Description

The Eastern Screech-Owl is a small, nocturnal, woodland owl of eastern North America and is one of our more common owls. It is the smallest eastern owl next to the Northern Pygmy-Owl and is the smallest eared owl found east of the Rocky Mountains. It is a squat-looking owl that sits erect, its plumage fluffed out, with feet and legs obscured, and its distinct ear tufts raised. The iris is bright yellow and this owl will swivel its head into contorted positions to gain a good view because its eyes are immovable. Its bill is gray-green, with tufts of bristly feathers around its base, and toes are yellow. Its plumage is either mainly grayish or reddish-brown (see Morphs) variegated dark and light, that resembles a furrowed tree bark pattern. Its facial disk is bordered by black.

## Size

The Eastern Screech-Owl is the 12th largest North American owl overall. Because of its puffed plumage it gives the impression of being larger than it is. Females are 5 to 10% larger than males. Females average 9.2 inches (23 centimeters) and males average 8.2 inches (21 centimeters) in length, respectively. Wingspans average 22 inches (56 centimeters) for females and 21 inches (54 centimeters) for males. Weights average 7.3 ounces (208 grams) for females and 7.0 ounces (200 grams) for males.

## Morphs

There are two color morphs, a gray phase and a reddish-brown phase.

## Specific Description

### Adult (gray phase)

- refer to above
- facial disks dusky white with fine gray-brown mottling
- overall gray-brown, with gray narrow vertical stripes, bars, and spots on underparts, and barred wings and tail
- legs light cinnamon buff

### Adult (red phase)

- refer to above
- similar pattern to gray phase except cinnamon instead of gray
- face plain light cinnamon
- whitish superciliary and loreal plumage

### Juvenile (gray phase)

- similar to adults but indistinct stripes and bars more patterned
- many feathers tipped with white

### Juvenile (red phase)

- grayish brown, but distinctly rufescent color overall
- bars and stripes less distinct than adults

## Similar Species

The Eastern Screech-Owl is only likely to be confused with the Western Screech-Owl.

These owls can only be distinguished by their different calls, but only occur together locally in eastern Colorado and southern Texas.

#### Other Names

It has also been known as Ghost Owl, Dusk Owl, Little-eared Owl, Mouse Owl, Shivering Owl, Spirit Owl, Little Dukelet, Texas Screech-Owl, and Red Owl.

#### Etymology

The scientific name *Otus asio* translates into "eared owl" or "horned owl".

#### Mythology

Cherokee shamans valued Eastern Screech-Owls as consultants as the owls could bring on sickness as punishment. Oto-Missouris thought that if you heard a screech-owl call, then death is going to occur. Louisiana Cajuns thought you should get up from bed and turn your left shoe upside down to avert disaster, if you heard one calling late at night.

#### RANGE

North America - Resident from extreme southeastern Alberta, southern Saskatchewan, southern Manitoba, northern Minnesota, northern Michigan, southern Ontario, southwestern Quebec, and Maine south through the eastern United States, northeastern Montana, eastern Wyoming, northeastern Colorado, Kansas, western Oklahoma, and west-central Texas. May breed in central Alberta.

Subspecies -There are 9 recognized subspecies of this owl of which 5 occur in North America.

*Otus asio asio* - occurs in Minnesota, peninsular Michigan, southern Quebec, and southern Maine south to Missouri and northern parts of Mississippi, Alabama, and Georgia.

*Otus asio floridanus* - occurs in Florida and west along the Gulf Coast to Louisiana and north to Arkansas.

*Otus asio hasbroucki* - occurs from central Kansas to Oklahoma and Texas.

*Otus asio maxwelliae* - occurs from southeastern Alberta, southern Saskatchewan, southern Manitoba, eastern Montana, and the Dakotas south to eastern Montana, western Nebraska, western Kansas, and northeastern Colorado.

*Otus asio mccallii* - occurs locally only in the Lower Rio Grande of Texas.

The Eastern Screech-Owl also occurs in Mexico.

#### BEHAVIOR

During direct flight, the Eastern Screech-Owl flies fairly rapidly with a steady wingbeat, about 5 strokes/second. It rarely glides or hovers, but may fly bat-like with erratic movements, when maneuvering through wooded areas. Wings are broad and the head is held tucked in giving a flying bird a stubby appearance.

It hunts at night, from dusk to dawn, but most hunting is done during the first four hours of darkness. It searches for prey mainly while in flight, rather from a perch. When prey are spotted, the owl dives quickly and seizes it in its talons. It also captures flying insects on the wing. Small prey is usually swallowed whole on the spot. Larger prey is carried in the bill to a perch and then torn apart. This owl tends to frequent areas in its home range where it hunted successfully on previous nights. It is an opportunistic hunter and will switch to

almost any suitably-sized prey when abundant. It has even been observed fishing at holes in lake ice left by ice fishers or at open pockets of water.

The Eastern Screech-Owl is essentially non-migratory except when severe food shortages or severe winters force some populations to move southward. Adults tend to remain near their breeding areas year-round while juveniles disperse in the autumn. Siblings tend to disperse together.

Small territories around nest sites are vigorously defended by males, but pairs may nest within 164 feet (50 meters). Breeding territories range from 10 to 15 acres (4 to 6 hectares) in wooded suburban areas to 75 acres (30 hectares) in more open rural areas. Home ranges are much larger, up to 200 acres (80 hectares), but these are not defended and there is much overlap between pairs.

Captive owls have lived over 20 years, but wild birds would be unlikely to reach this age. Juvenile and adult mortality may reach as high as 70% and 30% respectively. Predators of this owl include Great Horned Owls, Barred Owls, Long-eared Owls, Great Gray Owls, Short-eared Owls, Snowy Owls, mink, weasels, raccoons, skunks, snakes, crows, and Blue Jays. Cannibalism by other screech-owls also occurs. Eastern Screech-Owls are the second most frequently killed bird by moving vehicles, after American Robins.

Courtship behavior is elaborate. Males approach females, calling from different branches until they are close. The male then bobs and swivels head, bobs entire body, and even slowly winks one eye at the female. If she ignores him, bobbing and swiveling motions intensify. If she accepts him, she moves close and they touch bills and preen each other.

#### Adaptations

Uses variegated plumage as camouflage. When threatened, it stretches body and tightens feathers in order to look like a branch stub to avoid detection, but will take flight when it knows it has been detected. In open roosts, gray-phase birds tend to roost next to a tree trunk, whereas red-phase birds tend to roost in outer foliage, possibly because of thermal requirements.

Like all owls, it has exceptional hearing, that aids in nocturnal hunting.

It preens often and readily uses bird baths, but nests are often filled with pellets, prey remains, etc.

The Eastern Screech-Owl can be very aggressive and will attack larger owls, other birds, or mammals when protecting nests or defending itself. It can be very tame when handled by humans.

#### HABITAT

The Eastern Screech-Owl inhabits open mixed woodlands, deciduous forests, parklands, wooded suburban areas, riparian woods along streams and wetlands (especially in drier areas), mature orchards, and woodlands near marshes, meadows, and fields. It avoids dense forests because Great Horned Owls use that habitat, and high elevation forests. It hunts mainly in open woodlands, along the edges of open fields or wetlands, or makes short forays into open fields.

It roosts mainly in natural cavities in large trees, including cavities open to the sky during dry weather. In suburban and rural areas it may roost behind loose boards on buildings, boxcars, or water tanks. It will also roost in dense foliage of trees, usually on a

branch next to the trunk, or in dense scrubby brush.

## VOICE

Males have a lower-pitched voice than females. The male's most common call is an eerie, mellow, muted trill "hoo-hoo-hoo....", or bouncing song, that rises in pitch, before sliding down again. This call is given by the male during the mating and nesting seasons, each call lasting 2 to 3 seconds with about 35 notes given, and repeated at various intervals. This call is primarily territorial in nature and announces ownership of nest cavities. When young are in the nest, adults give a descending whinny call, rather than the bouncing call. This call is given through the winter until the mating call begins again. Females tend to bark or hoot when defending broods. Young "peep" for food during their first three weeks, then chatter or hum later. Fledglings demand food by a harsh "keeeerr-r-r-r". It does not call while in flight, except when alarmed.

## PELLETS

Pellets are medium-sized, averaging about 1.5 by 0.75 inches (3.8 by 1.9 centimeters). Pellets are compact, dark gray, ovals that are composed of fur, feathers, bones, teeth, and chitin. Two to 4 pellets are cast each day.

## FOODS

An extremely wide range of prey species is captured. Its most favored prey is small microtine rodents and deer mice. Other mammals taken include wood and Norway rats, chipmunks, cotton rats, squirrels, shrews, bats, and moles. Large flying insects such as beetles, katydids, grasshoppers, locusts, crickets, mantids, roaches, cicadas, moths, horseflies, and dragonflies are readily taken. Birds comprise about 7% of its diet and include many species of small songbirds but also larger birds such as Northern Bobwhite, Rock Dove, Ruffed Grouse, and other screech-owls. Birds may be captured more often during periods of heavy songbird migration. Other prey include small fish, small snakes, lizards, and soft-shelled turtles, small frogs, toads, and salamanders, and invertebrates such as crayfish, snails, spiders, earthworms, scorpions, and centipedes.

## NESTING

The Eastern Screech-Owl nests almost exclusively in tree cavities. Enlarged natural cavities are preferred but it will also use old Pileated Woodpecker and Northern Flicker cavities. Nest cavities are usually 4 to 5 inches (10.2 to 12.7 centimeters) wide and are usually shaded from bright sunlight. Nest cavities are usually 6.5 to 20 feet (2 to 6 meters) above the ground, but may be up to 50 feet (15 meters) up. This owl will readily nest in suitable nest boxes and occasionally behind loose boards on abandoned buildings or barns. Nests are almost always in deciduous trees such as oaks, elms, maples, sycamores, willows, and apples; occasionally in pines.

No nest material is added. Eggs are laid on natural sawdust on floor of cavity. Clutch size ranges from 2 to 8 eggs, averaging 3 to 5 eggs in most areas. The average clutch size increases from south to north and from east to west. Eggs are laid every two days and incubation begins after laying of the first egg. The incubation period is about 26 days and the fledging period about 31 days. Females do most of the incubating but males will assist.

The male provides most of the food while the female broods young, and stockpiles food during early stages. When young are small the female rips up food for them.

Eastern Screech-Owls are single brooded, but may re-nest if first clutches are lost. Pairs



will often reuse nest sites in consecutive years. Pairs mate for life but will accept a new mate if the previous mate disappears. Gray and red color phases will mate together.

## CONSERVATION

The Eastern Screech-Owl is dependent on open deciduous woodlands that have suitable nesting sites (large trees with natural or woodpecker cavities) and sufficient prey densities. Urbanization has caused local declines in heavily developed areas of eastern North America. Removal of riparian forest in drier regions will cause population declines because most habitat is confined to riparian zones. However, this adaptable owl can survive in wooded suburban areas and city parks as long as they are not directly persecuted. Populations likely fluctuate more depending on prey availability.

Nest box programs can enhance local populations, especially in areas short of suitable tree cavities.

The Eastern Screech-Owl feeds mainly on small rodents and flying insects that are considered injurious to agricultural or forestry crops. Its depredation on songbirds is relatively insignificant because birds comprise a very small percentage of its diet.

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# Flammulated Owl - Gray Phase

*Otus flammeolus*

## General Description

The Flammulated Owl is a tiny woodland owl of western North America and is one of the most sought-after species by bird-watchers. It is a short, squat-looking, sparrow-sized owl that resembles a tiny screech-owl. It has short, sharp ear tufts that are visible only at close range. The eyes are dark brown, giving it a placid look. Its bill is slate black. Its legs are short and heavily feathered with small naked feet. Plumage is variable but mainly light below with broad to fine dark vertical streaks resembling furrowed tree bark. It is variegated dark on back and wings with light spots and bars. Flame-shaped cinnamon marks on scapulars.

## Size

The smallest eared owl, it ranks as the 4th smallest in overall size. Females are slightly larger than males. Females average 6.8 inches (17 centimeters) in length and males average 6.2 inches (16 centimeters) in length. Females weigh about 4.8 ounces (137 grams) and males about 4.4 ounces (126 grams). Its wingspan is about 18 inches (45 centimeters) for both sexes.

## Morphs

There are two color morphs, a gray phase most common in northern parts of its range, and a reddish phase more common in southern parts of its range.

## Specific Description

### Adult (gray phase)

- refer to above
- overall plumage gray and brownish
- V-shaped rufous marks on scapulars
- grayish facial disk with rufous fringe around disk and eye
- cinnamon throat

### Adult (red phase)

- refer to above
- upperparts generally cinnamon brown
- entire face cinnamon except white eyebrows

### Juvenile (both phases)

- similar to adults but colors less intense and upperparts more barred with gray

## Similar Species

The Flammulated Owl is only likely to be confused with the Western or Whiskered Screech-Owl. These owls have similar variegated plumage patterns but are much larger and have a yellow, rather than brown iris.

## Other Names

It has also been known as Flammulated Screech-Owl, Dwarf Owl, Flammulated Scops Owl, Little Owl, Little Flame-colored Owl.

## Etymology

The scientific name *Otus flammeolus* translates into "flaming eared owl".

## Mythology

Hopi people felt that Flammulated Owls taught their ancestors that silence would lead to a successful hunt. In western Mexico, it was thought to travel between the worlds of the living and dead as a messenger from the "land of the dead".

## RANGE

North America - Breeds locally from south-central British Columbia, north-central Washington, eastern Oregon, east-central Idaho, western Montana, and northern Colorado south to southern California, southern Arizona, southern New Mexico, and western Texas.

Subspecies - There are no recognized races.

The Flammulated Owl also occurs in Mexico and Central America.

## BEHAVIOR

Flight is rapid and jerky when flying direct, but hovers briefly when checking on prey. It tends to sit erect with tail pointing downwards. The Flammulated Owl is a "sit and wait" predator. It prefers to perch in upper tree branches while hunting, then glides down to capture prey on ground in a sweeping curve. It also captures prey from tree crowns, trunks and branches, in shrubs, and by hawking flying insects.

Northern populations are migratory while those in central North America are resident. Southern United States populations may move downslope for the winter but there are only isolated winter records from the southern United States.

Males return to breeding territories before females and almost always reoccupy territories used the previous year. Some pairs reunite for 2 or 3 consecutive years. Breeding territories are smaller than larger owl species, because less habitat is required to provide food, nest sites, and roosting sites. Breeding territories are usually less than 900 feet (275 meters) in diameter, while home ranges may be 21 to 60 acres (8.5 to 24 hectares).

As a very small owl, which is vulnerable to predation from other owls and hawks, it is very secretive. Great Horned Owls, Long-eared Owls, and Sharp-shinned Hawks are known predators. It is curious and non-aggressive towards humans except when nesting when it may attack observers.

## Adaptations

The Flammulated Owl is a nocturnal owl that hunts during dusk and at night. It flies occasionally during the day, but does not hunt during daylight hours. It has a very acute sense of hearing and sight in the dark which allows it to capture prey at night. It occurs in a very narrow ecological niche and has limited adaptability.

The Flammulated Owl has extremely well-camouflaged plumage that is its primary defense against predators. During the day it roosts in cavities or behind dense branches. When perched on a branch against a tree trunk, it appears to be part of the tree. It also roosts in dense vegetation to provide some thermoregulation protection against hot sun or cold winds. Recently fledged young are unusually quiet, which helps them avoid predation.

This tiny owl has an unusually low-pitched call, which contrasts with the general trend of smaller owls and higher-pitched calls. This is caused by unusually thickened vibratory membranes in its syrinx and a swelling throat chamber.

#### HABITAT

This species inhabits mainly warm and dry mixed montane coniferous forests. These forests contain mainly pines such as ponderosa pine, Douglas-fir, true firs, and spruces. It prefers forests with a relatively open canopy and a selection of old snags for nesting; and grassy openings for foraging. It avoids dense forests, very high elevation forests, and second-growth forests. It also frequents mixed conifer and trembling aspen forests. It uses more forest types and occupies a greater altitudinal range in the United States than in Canada. Roosts in tree cavities or on branches of well-vegetated trees, often against the trunk.

#### VOICE

It is usually silent except during the breeding season. The primary calls of the male are a low-pitched mellow hoot ("hooop") emitted once every 2 to 5 seconds or a courtship "hoo-Hoop". Females emit a high raspy meow when begging for food from the male. During courtship males and females produce clucks and screeches. Near the nest, adults emit two-syllable mewing calls. Young in the nest are very vocal, producing raspy buzzes while begging for food.

#### PELLETS

Like all owls, it produces pellets of undigested prey material. Pellets are small and loosely formed, and contain insect parts. No other data available on shape, color etc.

#### FOODS

The Flammulated Owl is almost exclusively insectivorous and rarely captures vertebrate prey. It tends to forage on insects that occur in forest openings or along forest/grassland edges. In a study of foods from throughout its range moths, beetles, and grasshoppers were major foods with other flying insects, spiders, scorpions, millipedes, and centipedes also taken. In one Oregon study, all prey items were arthropods with 72% being orthopterans, most being grassland species. In another Oregon study, remains of one vole and one songbird were found.

#### NESTING

The Flammulated Owl is entirely dependent on pre-existing cavities in large decayed or dead trees for nest sites. Most nests have been found in old Northern Flicker cavities. Pileated Woodpecker and rotted-out natural cavities are also used. Nest trees include aspens, pines, and Douglas-firs. Nest-holes range from 10 to 40 feet (3 to 12 meters) above the ground. This owl nests relatively late compared to other owls with eggs being laid from mid April in the south to June in the north. Clutch size ranges from 2 to 4 eggs, with an average of 3 eggs. About 21 to 22 days incubation are required before eggs hatch. Females do all incubating of eggs and brooding of young. During the nesting season males deliver food to the female on the nest. Adults tend to divide broods after they leave the nest, a unique behavior in owls. Young remain near the nest for a few weeks before dispersing to other areas. Although this owl often returns to its previous year's nesting territory, different nesting cavities are usually used.

## CONSERVATION

Throughout its range populations are likely underestimated because of the secretive nature of this little owl. Thus, management concerns based on lack of data may be misplaced in many areas.

However, Flammulated Owls inhabit forests that have high commercial value and are threatened in the long term by harvesting of these forests. Because their breeding habitat requirements are relatively specific and they depend on woodpecker cavities for nest sites, the elimination of live trees and snags suitable for larger woodpecker species, by timber harvest, silviculture, or firewood collecting, will reduce nest-site availability. Because of their small territories, large scale clearcut logging in prime habitats will eliminate significant numbers of owls. Setting aside forest reserves and careful selective logging will help conserve populations.

This owl will use nest boxes as nesting sites. Nest box programs may help maintain populations in areas with limited numbers of natural nest sites.

Little is known of its migratory or wintering ecology. Since it winters almost exclusively in Mexico and Central America, rapid habitat loss in that region is a major concern.

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# Flammulated Owl - Red Phase

*Otus flammeolus*

## General Description

The Flammulated Owl is a tiny woodland owl of western North America and is one of the most sought-after species by bird-watchers. It is a short, squat-looking, sparrow-sized owl that resembles a tiny screech-owl. It has short, sharp ear tufts that are visible only at close range. The eyes are dark brown, giving it a placid look. Its bill is slate black. Its legs are short and heavily feathered with small naked feet. Plumage is variable but mainly light below with broad to fine dark vertical streaks resembling furrowed tree bark. It is variegated dark on back and wings with light spots and bars. Flame-shaped cinnamon marks on scapulars.

## Size

The smallest eared owl, it ranks as the 4th smallest in overall size. Females are slightly larger than males. Females average 6.8 inches (17 centimeters) in length and males average 6.2 inches (16 centimeters) in length. Females weigh about 4.8 ounces (137 grams) and males about 4.4 ounces (126 grams). Its wingspan is about 18 inches (45 centimeters) for both sexes.

## Morphs

There are two color morphs, a gray phase most common in northern parts of its range, and a reddish phase more common in southern parts of its range.

## Specific Description

### Adult (gray phase)

- refer to above
- overall plumage gray and brownish
- V-shaped rufous marks on scapulars
- grayish facial disk with rufous fringe around disk and eye
- cinnamon throat

### Adult (red phase)

- refer to above
- upperparts generally cinnamon brown
- entire face cinnamon except white eyebrows

### Juvenile (both phases)

- similar to adults but colors less intense and upperparts more barred with gray

## Similar Species

The Flammulated Owl is only likely to be confused with the Western or Whiskered Screech-Owl. These owls have similar variegated plumage patterns but are much larger and have a yellow, rather than brown iris.

## Other Names

It has also been known as Flammulated Screech-Owl, Dwarf Owl, Flammulated Scops Owl, Little Owl, Little Flame-colored Owl.

## Etymology

The scientific name *Otus flammeolus* translates into "flaming eared owl".

## Mythology

Hopi people felt that Flammulated Owls taught their ancestors that silence would lead to a successful hunt. In western Mexico, it was thought to travel between the worlds of the living and dead as a messenger from the "land of the dead".

## RANGE

North America - Breeds locally from south-central British Columbia, north-central Washington, eastern Oregon, east-central Idaho, western Montana, and northern Colorado south to southern California, southern Arizona, southern New Mexico, and western Texas.

Subspecies - There are no recognized races.

The Flammulated Owl also occurs in Mexico and Central America.

## BEHAVIOR

Flight is rapid and jerky when flying direct, but hovers briefly when checking on prey. It tends to sit erect with tail pointing downwards. The Flammulated Owl is a "sit and wait" predator. It prefers to perch in upper tree branches while hunting, then glides down to capture prey on ground in a sweeping curve. It also captures prey from tree crowns, trunks and branches, in shrubs, and by hawking flying insects.

Northern populations are migratory while those in central North America are resident. Southern United States populations may move downslope for the winter but there are only isolated winter records from the southern United States.

Males return to breeding territories before females and almost always reoccupy territories used the previous year. Some pairs reunite for 2 or 3 consecutive years. Breeding territories are smaller than larger owl species, because less habitat is required to provide food, nest sites, and roosting sites. Breeding territories are usually less than 900 feet (275 meters) in diameter, while home ranges may be 21 to 60 acres (8.5 to 24 hectares).

As a very small owl, which is vulnerable to predation from other owls and hawks, it is very secretive. Great Horned Owls, Long-eared Owls, and Sharp-shinned Hawks are known predators. It is curious and non-aggressive towards humans except when nesting when it may attack observers.

## Adaptations

The Flammulated Owl is a nocturnal owl that hunts during dusk and at night. It flies occasionally during the day, but does not hunt during daylight hours. It has a very acute sense of hearing and sight in the dark which allows it to capture prey at night. It occurs in a very narrow ecological niche and has limited adaptability.

The Flammulated Owl has extremely well-camouflaged plumage that is its primary defense against predators. During the day it roosts in cavities or behind dense branches. When perched on a branch against a tree trunk, it appears to be part of the tree. It also roosts in dense vegetation to provide some thermoregulation protection against hot sun or cold winds. Recently fledged young are unusually quiet, which helps them avoid predation.



This tiny owl has an unusually low-pitched call, which contrasts with the general trend of smaller owls and higher-pitched calls. This is caused by unusually thickened vibratory membranes in its syrinx and a swelling throat chamber.

#### HABITAT

This species inhabits mainly warm and dry mixed montane coniferous forests. These forests contain mainly pines such as ponderosa pine, Douglas-fir, true firs, and spruces. It prefers forests with a relatively open canopy and a selection of old snags for nesting; and grassy openings for foraging. It avoids dense forests, very high elevation forests, and second-growth forests. It also frequents mixed conifer and trembling aspen forests. It uses more forest types and occupies a greater altitudinal range in the United States than in Canada. Roosts in tree cavities or on branches of well-vegetated trees, often against the trunk.

#### VOICE

It is usually silent except during the breeding season. The primary calls of the male are a low-pitched mellow hoot ("hooop") emitted once every 2 to 5 seconds or a courtship "hoo-Hoop". Females emit a high raspy meow when begging for food from the male. During courtship males and females produce clucks and screeches. Near the nest, adults emit two-syllable mewing calls. Young in the nest are very vocal, producing raspy buzzes while begging for food.

#### PELLETS

Like all owls, it produces pellets of undigested prey material. Pellets are small and loosely formed, and contain insect parts. No other data available on shape, color etc.

#### FOODS

The Flammulated Owl is almost exclusively insectivorous and rarely captures vertebrate prey. It tends to forage on insects that occur in forest openings or along forest/grassland edges. In a study of foods from throughout its range moths, beetles, and grasshoppers were major foods with other flying insects, spiders, scorpions, millipedes, and centipedes also taken. In one Oregon study, all prey items were arthropods with 72% being orthopterans, most being grassland species. In another Oregon study, remains of one vole and one songbird were found.

#### NESTING

The Flammulated Owl is entirely dependent on pre-existing cavities in large decayed or dead trees for nest sites. Most nests have been found in old Northern Flicker cavities. Pileated Woodpecker and rotted-out natural cavities are also used. Nest trees include aspens, pines, and Douglas-firs. Nest-holes range from 10 to 40 feet (3 to 12 meters) above the ground. This owl nests relatively late compared to other owls with eggs being laid from mid April in the south to June in the north. Clutch size ranges from 2 to 4 eggs, with an average of 3 eggs. About 21 to 22 days incubation are required before eggs hatch. Females do all incubating of eggs and brooding of young. During the nesting season males deliver food to the female on the nest. Adults tend to divide broods after they leave the nest, a unique behavior in owls. Young remain near the nest for a few weeks before dispersing to other areas. Although this owl often returns to its previous year's nesting territory, different nesting cavities are usually used.

## CONSERVATION

Throughout its range populations are likely underestimated because of the secretive nature of this little owl. Thus, management concerns based on lack of data may be misplaced in many areas.

However, Flammulated Owls inhabit forests that have high commercial value and are threatened in the long term by harvesting of these forests. Because their breeding habitat requirements are relatively specific and they depend on woodpecker cavities for nest sites, the elimination of live trees and snags suitable for larger woodpecker species, by timber harvest, silviculture, or firewood collecting, will reduce nest-site availability. Because of their small territories, large scale clearcut logging in prime habitats will eliminate significant numbers of owls. Setting aside forest reserves and careful selective logging will help conserve populations.

This owl will use nest boxes as nesting sites. Nest box programs may help maintain populations in areas with limited numbers of natural nest sites.

Little is known of its migratory or wintering ecology. Since it winters almost exclusively in Mexico and Central America, rapid habitat loss in that region is a major concern.

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# Great Horned Owl - Dark Phase

*Bubo virginianus*

## General Description

The Great Horned Owl is a very large, nocturnal, woodland owl that has the widest distribution of any owl in North America. It is our largest eared owl, with 2 inch (5.1 centimeters) long ear tufts and prominent facial markings. It sits erect, with ear tufts slanted outwards, and has a regal appearance. Its plumage is tight, but it still looks heavy. In flight, its wings are long and broad, narrowing at the tips, and it flies quickly with powerful wing strokes. It has the largest eyes of any North American owl and has a yellow iris. Its tail and flight feathers are strongly barred. Its plumage is brownish or grayish-brown overall, with buffy facial discs, often white throat, and profuse thin transverse bars on flanks, sides, and belly.

## Size

The Great Horned Owl is the second largest North American owl, after only the Snowy Owl. Females are 10 to 20% larger than males. Lengths average 24 inches (60 centimeters) for females and 20 inches (51 centimeters) for males. Wingspans average 56 inches (143 centimeters) for females and 53 inches (134 centimeters) for males. Weights average 3.5 pounds (1,597 grams) for females and 3.2 pounds (1,449 grams) for males.

## Morphs

The Great Horned Owl exhibits a wide range of plumage color variation. Ground colors range from very pale gray in Arctic populations to dark brown on the Pacific coast, but there is much individual plumage variation.

## Specific Description

### Adult

- refer to above
- white eyebrows and white throat often white extending down chest
- very large, bulky owl with prominent ear tufts
- all feathers light at base

### Juvenile

- similar to adults but more indistinct stripes
- overall plumage a ruddier orange brown
- white down persists around neck and underparts until first molt

## Similar Species

The Great Horned Owl could be confused with some other large owls. However, Barred and Spotted owls do not have ear tufts and their eyes are brown. The Great Gray Owl is nearly as large but has wide facial disks and no ear tufts. The Long-eared Owl has a similar overall plumage pattern, yellow eyes, and ear tufts, but it is much smaller and thin-looking, rather than heavyset like the Great Horned.

## Other Names

It has also been known as Big Cat Owl, Flying Tiger, Eagle Owl, Big Boot Owl, Big-eared Owl, Hoot Owl, King Owl, and Le Grand-Duc.

## Etymology

The scientific name *Bubo virginianus* translates into "eagle owl from the states of Virginia". This owl was first described by ornithologists in Virginia.

## Mythology

California Newuks believed that after death, the brave and virtuous became Great Horned Owls. In the Sierras, native peoples felt this owl captured the souls of the dead and carried them to the underworld.

## RANGE

North America - Breeds from western and central Alaska, central Yukon, northwestern and southern Mackenzie, southern Keewatin, northern Manitoba, northern Ontario, northern Quebec, Labrador, and Newfoundland south throughout the United States. It does not occur on the Queen Charlotte Islands off the north coast of British Columbia. Winters generally throughout the breeding range, with the northernmost populations being partially migratory, wintering south to southern Canada and the northern United States.

Subspecies - There are 12 recognized subspecies of this owl, 10 of which occur in North America.

*Bubo virginianus algistus* - occurs in western Alaska.

*Bubo virginianus heterocnemis* - occurs in northern Quebec, Labrador, and on Newfoundland.

*Bubo virginianus lagophonus* - occurs in the interior of Alaska and Yukon south through Oregon to north-central California and northwestern Montana.

*Bubo virginianus occidentalis* - occurs from southern Alberta, Saskatchewan and Manitoba east to Isle Royale, and south to northeastern California and central Kansas.

*Bubo virginianus pacificus* - occurs from north-central California to extreme southern California.

*Bubo virginianus pallescens* - occurs in the interior from southeastern California east to north-central Texas and southward.

*Bubo virginianus saturatus* - occurs along the coast from southeastern Alaska south to the coast of northern California.

*Bubo virginianus scalariventris* - occurs in eastern Manitoba and northern and western Ontario.

*Bubo virginianus subarcticus* - occurs from southeastern Yukon, eastern British Columbia and Mackenzie Valley east to western Manitoba.

*Bubo virginianus virginianus* - occurs from Minnesota east to Nova Scotia and south to eastern Texas and Florida.

The Great Horned Owl also occurs in Mexico, Central America, and South America.

## BEHAVIOR

The Great Horned Owl is an extremely powerful flier with methodical wing beats. When attacking prey its strokes are quickened. It flies mainly just above treetops, but also weaves through forest or even soars to thousands of feet like a Buteo hawk.

It begins to hunt just before dark and leaves the protection of dense forests for more open hunting areas. It hunts by perching on snags and poles and watching for prey, or by gliding slowly above the ground. When prey is spotted it attacks ferociously and may take

prey 2 to 3 times heavier than itself. From high perches it dives down to the ground with wings folded, before snatching prey. Prey are usually killed instantly when grasped by its large talons. It also hunts by walking on the ground to capture small prey or wading into water to snatch frogs and fish. It has been known to walk into chicken coops to take domestic fowl. Rodents and small rabbits can be swallowed whole while larger prey are carried off and ripped apart at feeding perches or at the nest. Birds are often plucked first, and legs and wing tips discarded. During times of plenty, it may eat only part of each prey.

The Great Horned Owl is essentially non-migratory except when severe food shortages or severe winters force some populations to move southward. Adults tend to remain near their breeding areas year-round while juveniles disperse widely, over 150 miles (250 kilometers) in the autumn. Territories are maintained by the same pair for as many as 8 consecutive years. However, this owl is solitary in nature, only staying with its mate during the nesting season. Average home ranges in various studies have been shown to be approximately 1 square mile (2.5 square kilometers).

This is a long-lived owl with wild owls of 13 years and captive owls of 29 to 38 years being known. Mortality in the wild is thought to be about 30% annually for adult birds and about 60% for juveniles. Most mortality is directly or indirectly related to man. In one study, of 301 banded birds found dead, 69 were found dead of unknown causes, 62 had been shot, 44 had been trapped, 59 were hit by vehicles on roads, and 20 had been electrocuted. It has almost no natural enemies, except other Great Horned Owls and, occasionally, Northern Goshawks during disputes over nest sites.

The Great Horned Owl nests very early in the year, with calling beginning in early winter. During courtship both sexes hoot. When close they bow to each other, with drooped wings, before copulating. Mutual bill rubbing and preening also occurs. This owl is extremely aggressive when defending its nest and will continue to attack until the intruder is killed or driven off. Humans have been seriously injured at the nest by attacking owls, and hard-hats and face masks are standard equipment for Great Horned Owl biologists.

### Adaptations

All primaries are deeply fluted which aid in silent flight, a remarkable adaptation for such a large bird.

It can control expansion and contraction of pupils individually. It has excellent hearing as its large ear cavities are even more asymmetrically located than in the Barn Owl. Its ear coverts are moveable which aid in sound detection. It also has good diurnal vision.

The Great Horned Owl is very adaptable in habitat and prey utilization, which has allowed its very wide distribution. It is a bird often associated with wilderness but it can thrive in larger, wooded parks and wooded suburbs, because of its highly secretive nature.

### HABITAT

The Great Horned Owl frequents virtually all forested regions from ocean shores to treeline. It also frequents brushy hillsides, cliff faces, abandoned orchards, swamps, second-growth forests, and cities where it may perch on buildings. In grassland areas it nests and roosts in riparian forest along streams or in gulleys. It tends to seek high perches near open areas to search for prey, and prefers to hunt along the edges of forests and clearings. It roosts during the day mainly in dense conifers, on a branch near the trunk.

### VOICE

The Great Horned Owl has a large repertoire of sounds, ranging from deep booming hoots to shrill shrieks. The male's resonant territorial call "hoo-hoo hooooo hoo-hoo" can be heard over several miles during a still night. Both sexes hoot, but males have a lower-pitched voice than females. It gives a growling "krrooo-oo" or screaming note when attacking intruders. Other sounds include a "whaaa whaaaaaa-a-a-aarrk" from disturbed birds, a catlike "MEEE-OWww", barks, hair-raising shrieks, coos, and beak snapping. Some calls are ventriloquial. Most calling occurs from dusk to about midnight and then again just before dawn.

## PELLETS

Pellets are very large, about 3 to 4 inches (7.6 to 10.2 centimeters) long and 1.5 inches (3.8 centimeters) thick. Pellets are dark grayish-black, compact, with numerous bones, skulls, and teeth, and are held together by fur, feathers, and mucus. Skulls as wide as 1.2 inches (3 centimeters) are regurgitated whole. Pellets are regurgitated 6 to 10 hours after eating. Carrion beetles often hasten decomposition of pellets.

## FOODS

An extremely wide range of prey species (at least 253 identified) are captured, but rabbits and hares are its preferred prey. It eats everything from insects and scorpions up to marmots, geese, and herons. Mammalian prey includes all coexisting rodents, squirrels, mink, skunks, raccoons, armadillos, porcupines, domestic cats and dogs, shrews, moles, muskrats, and bats. Bird prey includes all other owls (except Snowy Owl), grouse, woodpeckers, crows, turkeys, ducks, pigeons, Red-tailed Hawks, bitterns, Great Blue Heron, ducks, swans, gulls, etc. Reptiles include snakes, turtles, lizards, and young alligators. Amphibians include frogs, toads, and salamanders. Other foods include fish, large insects, scorpions, centipedes, crayfish, worms, spiders, and road killed animals.

## NESTING

The Great Horned Owl nests primarily in large stick nests in trees and cacti, of other birds such as hawks (mainly Red-tailed Hawk), ravens, and ospreys, but also in rock crevices and caves on cliff faces, and rotted out snag tops. It also may nest in clumps of witches broom, old squirrel nests, in abandoned buildings, or on artificial platforms. Nests are usually in the interior of a forest stand, except for cliff nests which are usually fairly high up or screened by vegetation. Nesting begins very early (February) compared to other owls.

Old nests are not repaired before eggs are laid. Clutch size ranges from 1 to 6 eggs, but averages only 2 to 3 eggs. Timing of nesting can be advanced and numbers of eggs laid increased during years of high food availability. The female does all incubation and the male delivers food to the nest. Each young needs an average of 10 ounces (300 grams) of food/day throughout the nestling period. Young start roaming from the nest onto nearby branches at 6 to 7 weeks, when they are called "branchers", but cannot fly well until 9 to 10 weeks old. They are fed for another few weeks as they are slowly weaned. Families remain loosely associated during summer before young disperse in the autumn.

It is single-brooded but will lay replacement clutches, of fewer eggs, if the first clutch is lost.

## CONSERVATION

The Great Horned Owl suffers high degrees of mortality from humans. They are still routinely shot by farmers and rural-living people, who fear for their poultry and other small

animals. However, it is highly beneficial to man because of the large numbers of rodents it kills. It is also one of the owls most frequently killed by vehicles. Other than man, it has few natural enemies.

Populations are likely stable overall, except in heavily urbanized areas. Populations likely fluctuate more depending on prey availability. Removal of riparian forest in drier regions will cause population declines because most habitat is confined to riparian zones. However, this adaptable owl can survive in wooded suburban areas and city parks because of its highly secretive nature.

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# Great Horned Owl - Pale Phase

*Bubo virginianus*

## General Description

The Great Horned Owl is a very large, nocturnal, woodland owl that has the widest distribution of any owl in North America. It is our largest eared owl, with 2 inch (5.1 centimeters) long ear tufts and prominent facial markings. It sits erect, with ear tufts slanted outwards, and has a regal appearance. Its plumage is tight, but it still looks heavy. In flight, its wings are long and broad, narrowing at the tips, and it flies quickly with powerful wing strokes. It has the largest eyes of any North American owl and has a yellow iris. Its tail and flight feathers are strongly barred. Its plumage is brownish or grayish-brown overall, with buffy facial discs, often white throat, and profuse thin transverse bars on flanks, sides, and belly.

## Size

The Great Horned Owl is the second largest North American owl, after only the Snowy Owl. Females are 10 to 20% larger than males. Lengths average 24 inches (60 centimeters) for females and 20 inches (51 centimeters) for males. Wingspans average 56 inches (143 centimeters) for females and 53 inches (134 centimeters) for males. Weights average 3.5 pounds (1,597 grams) for females and 3.2 pounds (1,449 grams) for males.

## Morphs

The Great Horned Owl exhibits a wide range of plumage color variation. Ground colors range from very pale gray in Arctic populations to dark brown on the Pacific coast, but there is much individual plumage variation.

## Specific Description

### Adult

- refer to above
- white eyebrows and white throat often white extending down chest
- very large, bulky owl with prominent ear tufts
- all feathers light at base

### Juvenile

- similar to adults but more indistinct stripes
- overall plumage a ruddier orange brown
- white down persists around neck and underparts until first molt

## Similar Species

The Great Horned Owl could be confused with some other large owls. However, Barred and Spotted owls do not have ear tufts and their eyes are brown. The Great Gray Owl is nearly as large but has wide facial disks and no ear tufts. The Long-eared Owl has a similar overall plumage pattern, yellow eyes, and ear tufts, but it is much smaller and thin-looking, rather than heavyset like the Great Horned.

## Other Names

It has also been known as Big Cat Owl, Flying Tiger, Eagle Owl, Big Boot Owl, Big-eared Owl, Hoot Owl, King Owl, and Le Grand-Duc.

## Etymology

The scientific name *Bubo virginianus* translates into "eagle owl from the states of Virginia". This owl was first described by ornithologists in Virginia.

## Mythology

California Newuks believed that after death, the brave and virtuous became Great Horned Owls. In the Sierras, native peoples felt this owl captured the souls of the dead and carried them to the underworld.

## RANGE

North America - Breeds from western and central Alaska, central Yukon, northwestern and southern Mackenzie, southern Keewatin, northern Manitoba, northern Ontario, northern Quebec, Labrador, and Newfoundland south throughout the United States. It does not occur on the Queen Charlotte Islands off the north coast of British Columbia. Winters generally throughout the breeding range, with the northernmost populations being partially migratory, wintering south to southern Canada and the northern United States.

Subspecies - There are 12 recognized subspecies of this owl, 10 of which occur in North America.

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*Bubo virginianus heterocnemis* - occurs in northern Quebec, Labrador, and on Newfoundland.

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*Bubo virginianus occidentalis* - occurs from southern Alberta, Saskatchewan and Manitoba east to Isle Royale, and south to northeastern California and central Kansas.

*Bubo virginianus pacificus* - occurs from north-central California to extreme southern California.

*Bubo virginianus pallescens* - occurs in the interior from southeastern California east to north-central Texas and southward.

*Bubo virginianus saturatus* - occurs along the coast from southeastern Alaska south to the coast of northern California.

*Bubo virginianus scalariventris* - occurs in eastern Manitoba and northern and western Ontario.

*Bubo virginianus subarcticus* - occurs from southeastern Yukon, eastern British Columbia and Mackenzie Valley east to western Manitoba.

*Bubo virginianus virginianus* - occurs from Minnesota east to Nova Scotia and south to eastern Texas and Florida.

The Great Horned Owl also occurs in Mexico, Central America, and South America.

## BEHAVIOR

The Great Horned Owl is an extremely powerful flier with methodical wing beats. When attacking prey its strokes are quickened. It flies mainly just above treetops, but also weaves through forest or even soars to thousands of feet like a Buteo hawk.

It begins to hunt just before dark and leaves the protection of dense forests for more open hunting areas. It hunts by perching on snags and poles and watching for prey, or by gliding slowly above the ground. When prey is spotted it attacks ferociously and may take

prey 2 to 3 times heavier than itself. From high perches it dives down to the ground with wings folded, before snatching prey. Prey are usually killed instantly when grasped by its large talons. It also hunts by walking on the ground to capture small prey or wading into water to snatch frogs and fish. It has been known to walk into chicken coops to take domestic fowl. Rodents and small rabbits can be swallowed whole while larger prey are carried off and ripped apart at feeding perches or at the nest. Birds are often plucked first, and legs and wing tips discarded. During times of plenty, it may eat only part of each prey.

The Great Horned Owl is essentially non-migratory except when severe food shortages or severe winters force some populations to move southward. Adults tend to remain near their breeding areas year-round while juveniles disperse widely, over 150 miles (250 kilometers) in the autumn. Territories are maintained by the same pair for as many as 8 consecutive years. However, this owl is solitary in nature, only staying with its mate during the nesting season. Average home ranges in various studies have been shown to be approximately 1 square mile (2.5 square kilometers).

This is a long-lived owl with wild owls of 13 years and captive owls of 29 to 38 years being known. Mortality in the wild is thought to be about 30% annually for adult birds and about 60% for juveniles. Most mortality is directly or indirectly related to man. In one study, of 301 banded birds found dead, 69 were found dead of unknown causes, 62 had been shot, 44 had been trapped, 59 were hit by vehicles on roads, and 20 had been electrocuted. It has almost no natural enemies, except other Great Horned Owls and, occasionally, Northern Goshawks during disputes over nest sites.

The Great Horned Owl nests very early in the year, with calling beginning in early winter. During courtship both sexes hoot. When close they bow to each other, with drooped wings, before copulating. Mutual bill rubbing and preening also occurs. This owl is extremely aggressive when defending its nest and will continue to attack until the intruder is killed or driven off. Humans have been seriously injured at the nest by attacking owls, and hard-hats and face masks are standard equipment for Great Horned Owl biologists.

### Adaptations

All primaries are deeply fluted which aid in silent flight, a remarkable adaptation for such a large bird.

It can control expansion and contraction of pupils individually. It has excellent hearing as its large ear cavities are even more asymmetrically located than in the Barn Owl. Its ear coverts are moveable which aid in sound detection. It also has good diurnal vision.

The Great Horned Owl is very adaptable in habitat and prey utilization, which has allowed its very wide distribution. It is a bird often associated with wilderness but it can thrive in larger, wooded parks and wooded suburbs, because of its highly secretive nature.

### HABITAT

The Great Horned Owl frequents virtually all forested regions from ocean shores to treeline. It also frequents brushy hillsides, cliff faces, abandoned orchards, swamps, second-growth forests, and cities where it may perch on buildings. In grassland areas it nests and roosts in riparian forest along streams or in gulleys. It tends to seek high perches near open areas to search for prey, and prefers to hunt along the edges of forests and clearings. It roosts during the day mainly in dense conifers, on a branch near the trunk.

### VOICE

The Great Horned Owl has a large repertoire of sounds, ranging from deep booming hoots to shrill shrieks. The male's resonant territorial call "hoo-hoo hoooooo hoo-hoo" can be heard over several miles during a still night. Both sexes hoot, but males have a lower-pitched voice than females. It gives a growling "krrooo-oo" or screaming note when attacking intruders. Other sounds include a "whaaa whaaaaaa-a-a-aarrk" from disturbed birds, a catlike "MEEE-OWww", barks, hair-raising shrieks, coos, and beak snapping. Some calls are ventriloquial. Most calling occurs from dusk to about midnight and then again just before dawn.

## PELLETS

Pellets are very large, about 3 to 4 inches (7.6 to 10.2 centimeters) long and 1.5 inches (3.8 centimeters) thick. Pellets are dark grayish-black, compact, with numerous bones, skulls, and teeth, and are held together by fur, feathers, and mucus. Skulls as wide as 1.2 inches (3 centimeters) are regurgitated whole. Pellets are regurgitated 6 to 10 hours after eating. Carrion beetles often hasten decomposition of pellets.

## FOODS

An extremely wide range of prey species (at least 253 identified) are captured, but rabbits and hares are its preferred prey. It eats everything from insects and scorpions up to marmots, geese, and herons. Mammalian prey includes all coexisting rodents, squirrels, mink, skunks, raccoons, armadillos, porcupines, domestic cats and dogs, shrews, moles, muskrats, and bats. Bird prey includes all other owls (except Snowy Owl), grouse, woodpeckers, crows, turkeys, ducks, pigeons, Red-tailed Hawks, bitterns, Great Blue Heron, ducks, swans, gulls, etc. Reptiles include snakes, turtles, lizards, and young alligators. Amphibians include frogs, toads, and salamanders. Other foods include fish, large insects, scorpions, centipedes, crayfish, worms, spiders, and road killed animals.

## NESTING

The Great Horned Owl nests primarily in large stick nests in trees and cacti, of other birds such as hawks (mainly Red-tailed Hawk), ravens, and ospreys, but also in rock crevices and caves on cliff faces, and rotted out snag tops. It also may nest in clumps of witches broom, old squirrel nests, in abandoned buildings, or on artificial platforms. Nests are usually in the interior of a forest stand, except for cliff nests which are usually fairly high up or screened by vegetation. Nesting begins very early (February) compared to other owls.

Old nests are not repaired before eggs are laid. Clutch size ranges from 1 to 6 eggs, but averages only 2 to 3 eggs. Timing of nesting can be advanced and numbers of eggs laid increased during years of high food availability. The female does all incubation and the male delivers food to the nest. Each young needs an average of 10 ounces (300 grams) of food/day throughout the nestling period. Young start roaming from the nest onto nearby branches at 6 to 7 weeks, when they are called "branchers", but cannot fly well until 9 to 10 weeks old. They are fed for another few weeks as they are slowly weaned. Families remain loosely associated during summer before young disperse in the autumn.

It is single-brooded but will lay replacement clutches, of fewer eggs, if the first clutch is lost.

## CONSERVATION

The Great Horned Owl suffers high degrees of mortality from humans. They are still routinely shot by farmers and rural-living people, who fear for their poultry and other small

animals. However, it is highly beneficial to man because of the large numbers of rodents it kills. It is also one of the owls most frequently killed by vehicles. Other than man, it has few natural enemies.

Populations are likely stable overall, except in heavily urbanized areas. Populations likely fluctuate more depending on prey availability. Removal of riparian forest in drier regions will cause population declines because most habitat is confined to riparian zones. However, this adaptable owl can survive in wooded suburban areas and city parks because of its highly secretive nature.

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# Northern Pygmy Owl - Gray Phase

*Glaucidium gnoma*

## General Description

The Northern Pygmy-Owl is a tiny, woodland, diurnal owl that is most active between dawn and dusk. It is widespread across western North America. It is slightly larger than sparrow-sized with grayish or brownish upperparts and light belly that is boldly streaked with brown. Its head and nape are liberally sprinkled with whitish dots. On its nape are 2 distinctive, vertical black patches that resemble an extra pair of eyes. Its relatively long tail is distinctly barred with 6 to 7 light stripes. Its eyes are yellow and have a piercing quality similar to the Northern Hawk Owl. At rest it sits with its tail cocked away from vertical, and often twitches its tail when excited. In flight it resembles a shrike with rapid wing beats and rounded wing tips.

## Size

The Northern Pygmy-Owl is the second smallest owl in North America. Only the Elf Owl is smaller. Females are about 10% larger than males. Lengths average 7.3 inches (18.5 centimeters) for females and 6.5 inches (16.5 centimeters) for males. Wingspans average 15 inches (38 centimeters) for females and males. Weights average 1.6 ounces (45 grams) for females and 1.5 ounces (41 grams) for males. The interior subspecies (californicum) birds are heavier, females averaging 2.6 ounces (73 grams) and males averaging 2.2 ounces (62 grams).

## Morphs

There are two color phases, a gray phase typical of northern populations and a red phase that becomes common in southern populations.

## Specific Description

### Adult (gray phase)

-refer to above

-unmistakable because of small size and long and barred tail

### Adult (red phase)

-similar patterns as gray phase but overall plumage is browner, spots on head are cinnamon or buff, and throat and sides are cinnamon-brown

## Juvenile

-similar to adults but with unspotted and grayer head, and fluffy plumage

## Similar Species

The Northern Pygmy-Owl should not be confused with any other owl in Canada and most of the United States. In southern Arizona, Mexico, and Central America it could be easily confused with the Ferruginous Pygmy-Owl, which has a different call and is more rufous-colored. The tiny Elf Owl has a shorter tail, is darker overall, and is nocturnal. In flight, it may resemble a shrike but shrikes have a black facial mask and light gray plumage.

## Other Names

It has also been known as Pygmy Owl, Rocky Mountain Pygmy Owl, Vancouver Pygmy



Owl, California Pygmy Owl, and Dwarf Owl.

### Etymology

The scientific name *Glaucidium gnoma* translates into "little dwarf or gnome owl".

### Mythology

No information on mythology

### RANGE

North America - Resident from central British Columbia (except the Queen Charlotte Islands) and possibly extreme southeastern Alaska, southwestern Alberta, and western Montana south, mostly in mountainous regions, to southern California, extending east as far as central Colorado and New Mexico.

Subspecies - There are 6 recognized subspecies of this owl, 4 of which occur in North America.

*Glaucidium gnoma californicum* - an interior race that occurs from British Columbia south to southern California and northern Arizona and east to northwestern Wyoming, Colorado, and New Mexico.

*Glaucidium gnoma gnoma* - occurs from southern Arizona southward into Mexico

*Glaucidium gnoma grinnelli* - occurs only along the coast from British Columbia (possibly southeastern Alaska) to southern California.

*Glaucidium gnoma swarthi* - found only on Vancouver Island, British Columbia

The Northern Pygmy-Owl also occurs in Baja California, the interior of Mexico, Guatemala, and central Honduras.

### BEHAVIOR

The Northern Pygmy-Owl is very secretive and tends to perch and roost in thickets where it is safe from predators. At times, it will sit atop the highest spire of a tree. When perched it often jerks its tail upwards or moves its head erratically. It makes short rapid flights between perches, plummeting downwards as it leaves a perch before leveling off, and swooping up to the next. It tends to land low in a tree, then moves up through the tree to a higher perch. Its flight is relatively noisy for an owl.

Despite its small size, the Northern Pygmy-Owl is one of the fiercest owls, and will attack prey or drive off intruders several times its own size. It is a "sit and wait" predator, that hunts mainly by vision alone. It dives down onto prey on the ground and drives its talons into the prey's throat. It ferociously attacks birds in shrubs, crashing into its victim. Most prey is carried off in its feet to feeding sites. Birds are usually plucked before being consumed. It often eats only the brains of birds and the soft abdomen of insects. This little owl can carry prey weighing 2 to 3 times its own weight. During winter, surplus prey is cached in a cavity, often in large quantities. These caches help small owls like this meet their metabolic needs during very cold winter periods. Summer caches are usually much smaller.

The Northern Pygmy-Owl is essentially sedentary, except for altitudinal movements downslope in winter. Southward irruptions during winter may occur in years of scarce food supply. They are very unsociable birds, remaining solitary much of the year. There is no information on territory size, but the similar Eurasian Pygmy-Owl has territories from 500 to

4,200 acres (200 to 1,700 hectares), and the Northern Pygmy-Owl likely has similar-sized territories.

There is no information on longevity or mortality. Potential predators of this owl are other owls, jays, crows, ravens, snakes, squirrels, and weasels.

During courtship both sexes call to each other with their mating trill. They also pass food to each other and snuggle closely.

This owl is known to search out other pygmy-owls to chase, as if for fun. When threatened it puffs its feather and spreads its tail to make itself look larger. When hiding, it tries to look thin, faces the danger, and closes its eyes into slits.

### Adaptations

The Northern Pygmy-Owl avoids predation by most larger owls by being active during the day and roosting in thick cover during the night or tight against a tree trunk. It is highly adapted to daytime living, and may have the poorest nighttime vision of all North American owls. Its large, black spots on its nape are thought to help ward off surprise attack from the rear, by making it look larger than it really is.

### HABITAT

The Northern Pygmy-Owl inhabits open forests from valley bottoms up to treeline. In the north these forests are mainly spruce, hemlock, and fir dominated. In southern areas, it favors mixed pine-oak forests. It does not inhabit dense, continuous forest. In all areas it hunts in forest clearings, along the edges of meadows, fields, wetlands, and roadsides, and through old burns and logged areas. For roosting it likes quiet, shady alder thickets. During the breeding season it inhabits open forests with a selection of snags with old woodpecker cavities.

### VOICE

The primary call of the male Northern Pygmy-Owl is a series of repetitive, whistled hoots "too-too-too-too-too-too", separated by pauses of 1 to 2 seconds. The subspecies found from southern Arizona through Central America emits series of double hoots, "too-too, too-too, too-too". This call is territorial in nature and is usually given in the early evening and before dawn, and may be heard year-round. The male gives a softer version of this call when bringing food to his mate. The female calls much less often and it has a cackling quality. Other calls are not well-described but include an ascending staccato series of whistles. When excited, they may emit a high-pitched trill (8 notes/second).

### PELLETS

Pellets are very small, averaging about 1.2 inches (3 centimeters) long. They are formed only occasionally because this owl does not consume large amounts of fur, feathers, or bone. The pellets tend to fall apart shortly after ejection.

### FOODS

The Northern Pygmy-Owl feeds on a wide range of small prey, probably including all small mammals, birds, and reptiles and amphibians in its range. Voles make up the bulk of its diet, with birds comprising most of the rest. Insects may be very important when they are most abundant. It also takes toads, frogs and small lizards and snakes. Other small mammals include shrews, mice, chipmunks, bats, moles, young rabbits, and weasels. Birds

include mainly songbirds, but birds as large as California Quail are taken.

## NESTING

The Northern Pygmy-Owl is almost entirely dependent on old woodpecker cavities for nest sites. It also nests in natural tree cavities and there is one record of a nest in an old Cactus Wren nest. Nest trees are usually dead and are usually coniferous in the boreal forest and deciduous in more southern areas. Nest cavities range from 10 to 75 feet (3 to 23 meters) above ground, averaging about 20 to 23 feet (6 to 7 meters).

Eggs are laid between April and June. Clutch size ranges from 3 to 7 eggs with an average of 3 to 4 eggs. Average clutch size may increase from south to north. Females do most, if not all, of the incubating and brooding with the male bringing food and defending the nest. The incubation period is about 29 days. Unlike all other North American owls, this owl begins incubation only after the clutch is complete, so that young tend to hatch over a period of 1 to 2 days, rather than one every 1 to 2 days. Males increase delivery of food to the nest after young hatch. Young grow quickly, reaching 60% of adult size after 2 weeks. Young fledge at about 30 days, when they are capable of flight. Fledglings are then fed and defended by their parents for a further 20 to 30 days. Family groups tend to break up in late summer or autumn.

Northern Pygmy-Owls are single-brooded. It is not known if replacement clutches are laid. Nest cavities may be used for several consecutive years by the same birds.

## CONSERVATION

The Northern Pygmy-Owl does not come into conflict with man's interests so is not persecuted by people very much. It also frequents forests that are lightly-used by people. They do take more songbirds than other owl species, but also take many rodents and insects that are injurious to crops and forests.

Clearing of dense forests has probably increased habitat because they tend to inhabit edges of forests. But because they are dependent on old woodpecker cavities for nesting silviculture practices that remove snags destroys good nesting habitat.

This little owl is often mobbed by small songbirds such as chickadees, juncos, blackbirds, wrens, and hummingbirds as these birds seem to know that pygmy-owls are highly predatory on songbirds.

## REFERENCES

Earhart, C.M. and N.K. Johnson. 1970. Size dimorphism and food habits of North American owls. *Condor* 72:251-264.

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Webb, B. 1982. Distribution and nesting requirements of montane forest owls in Colorado. *Colorado Field Ornithologist's Journal* 16:26-32, 58-64.

# Northern Pygmy-Owl - Red Phase

*Glaucidium gnoma*

## General Description

The Northern Pygmy-Owl is a tiny, woodland, diurnal owl that is most active between dawn and dusk. It is widespread across western North America. It is slightly larger than sparrow-sized with grayish or brownish upperparts and light belly that is boldly streaked with brown. Its head and nape are liberally sprinkled with whitish dots. On its nape are 2 distinctive, vertical black patches that resemble an extra pair of eyes. Its relatively long tail is distinctly barred with 6 to 7 light stripes. Its eyes are yellow and have a piercing quality similar to the Northern Hawk Owl. At rest it sits with its tail cocked away from vertical, and often twitches its tail when excited. In flight it resembles a shrike with rapid wing beats and rounded wing tips.

## Size

The Northern Pygmy-Owl is the second smallest owl in North America. Only the Elf Owl is smaller. Females are about 10% larger than males. Lengths average 7.3 inches (18.5 centimeters) for females and 6.5 inches (16.5 centimeters) for males. Wingspans average 15 inches (38 centimeters) for females and males. Weights average 1.6 ounces (45 grams) for females and 1.5 ounces (41 grams) for males. The interior subspecies (californicum) birds are heavier, females averaging 2.6 ounces (73 grams) and males averaging 2.2 ounces (62 grams).

## Morphs

There are two color phases, a gray phase typical of northern populations and a red phase that becomes common in southern populations.

## Specific Description

### Adult (gray phase)

-refer to above

-unmistakable because of small size and long and barred tail

### Adult (red phase)

-similar patterns as gray phase but overall plumage is browner, spots on head are cinnamon or buff, and throat and sides are cinnamon-brown

## Juvenile

-similar to adults but with unspotted and grayer head, and fluffy plumage

## Similar Species

The Northern Pygmy-Owl should not be confused with any other owl in Canada and most of the United States. In southern Arizona, Mexico, and Central America it could be easily confused with the Ferruginous Pygmy-Owl, which has a different call and is more rufous-colored. The tiny Elf Owl has a shorter tail, is darker overall, and is nocturnal. In flight, it may resemble a shrike but shrikes have a black facial mask and light gray plumage.

## Other Names

It has also been known as Pygmy Owl, Rocky Mountain Pygmy Owl, Vancouver Pygmy

Owl, California Pygmy Owl, and Dwarf Owl.

### Etymology

The scientific name *Glaucidium gnoma* translates into "little dwarf or gnome owl".

### Mythology

No information on mythology

### RANGE

North America - Resident from central British Columbia (except the Queen Charlotte Islands) and possibly extreme southeastern Alaska, southwestern Alberta, and western Montana south, mostly in mountainous regions, to southern California, extending east as far as central Colorado and New Mexico.

Subspecies - There are 6 recognized subspecies of this owl, 4 of which occur in North America.

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*Glaucidium gnoma swarthi* - found only on Vancouver Island, British Columbia

The Northern Pygmy-Owl also occurs in Baja California, the interior of Mexico, Guatemala, and central Honduras.

### BEHAVIOR

The Northern Pygmy-Owl is very secretive and tends to perch and roost in thickets where it is safe from predators. At times, it will sit atop the highest spire of a tree. When perched it often jerks its tail upwards or moves its head erratically. It makes short rapid flights between perches, plummeting downwards as it leaves a perch before leveling off, and swooping up to the next. It tends to land low in a tree, then moves up through the tree to a higher perch. Its flight is relatively noisy for an owl.

Despite its small size, the Northern Pygmy-Owl is one of the fiercest owls, and will attack prey or drive off intruders several times its own size. It is a "sit and wait" predator, that hunts mainly by vision alone. It dives down onto prey on the ground and drives its talons into the prey's throat. It ferociously attacks birds in shrubs, crashing into its victim. Most prey is carried off in its feet to feeding sites. Birds are usually plucked before being consumed. It often eats only the brains of birds and the soft abdomen of insects. This little owl can carry prey weighing 2 to 3 times its own weight. During winter, surplus prey is cached in a cavity, often in large quantities. These caches help small owls like this meet their metabolic needs during very cold winter periods. Summer caches are usually much smaller.

The Northern Pygmy-Owl is essentially sedentary, except for altitudinal movements downslope in winter. Southward irruptions during winter may occur in years of scarce food supply. They are very unsociable birds, remaining solitary much of the year. There is no information on territory size, but the similar Eurasian Pygmy-Owl has territories from 500 to

4,200 acres (200 to 1,700 hectares), and the Northern Pygmy-Owl likely has similar-sized territories.

There is no information on longevity or mortality. Potential predators of this owl are other owls, jays, crows, ravens, snakes, squirrels, and weasels.

During courtship both sexes call to each other with their mating trill. They also pass food to each other and snuggle closely.

This owl is known to search out other pygmy-owls to chase, as if for fun. When threatened it puffs its feather and spreads its tail to make itself look larger. When hiding, it tries to look thin, faces the danger, and closes its eyes into slits.

### Adaptations

The Northern Pygmy-Owl avoids predation by most larger owls by being active during the day and roosting in thick cover during the night or tight against a tree trunk. It is highly adapted to daytime living, and may have the poorest nighttime vision of all North American owls. Its large, black spots on its nape are thought to help ward off surprise attack from the rear, by making it look larger than it really is.

### HABITAT

The Northern Pygmy-Owl inhabits open forests from valley bottoms up to treeline. In the north these forests are mainly spruce, hemlock, and fir dominated. In southern areas, it favors mixed pine-oak forests. It does not inhabit dense, continuous forest. In all areas it hunts in forest clearings, along the edges of meadows, fields, wetlands, and roadsides, and through old burns and logged areas. For roosting it likes quiet, shady alder thickets. During the breeding season it inhabits open forests with a selection of snags with old woodpecker cavities.

### VOICE

The primary call of the male Northern Pygmy-Owl is a series of repetitive, whistled hoots "too-too-too-too-too-too", separated by pauses of 1 to 2 seconds. The subspecies found from southern Arizona through Central America emits series of double hoots, "too-too, too-too, too-too". This call is territorial in nature and is usually given in the early evening and before dawn, and may be heard year-round. The male gives a softer version of this call when bringing food to his mate. The female calls much less often and it has a cackling quality. Other calls are not well-described but include an ascending staccato series of whistles. When excited, they may emit a high-pitched trill (8 notes/second).

### PELLETS

Pellets are very small, averaging about 1.2 inches (3 centimeters) long. They are formed only occasionally because this owl does not consume large amounts of fur, feathers, or bone. The pellets tend to fall apart shortly after ejection.

### FOODS

The Northern Pygmy-Owl feeds on a wide range of small prey, probably including all small mammals, birds, and reptiles and amphibians in its range. Voles make up the bulk of its diet, with birds comprising most of the rest. Insects may be very important when they are most abundant. It also takes toads, frogs and small lizards and snakes. Other small mammals include shrews, mice, chipmunks, bats, moles, young rabbits, and weasels. Birds

include mainly songbirds, but birds as large as California Quail are taken.

## NESTING

The Northern Pygmy-Owl is almost entirely dependent on old woodpecker cavities for nest sites. It also nests in natural tree cavities and there is one record of a nest in an old Cactus Wren nest. Nest trees are usually dead and are usually coniferous in the boreal forest and deciduous in more southern areas. Nest cavities range from 10 to 75 feet (3 to 23 meters) above ground, averaging about 20 to 23 feet (6 to 7 meters).

Eggs are laid between April and June. Clutch size ranges from 3 to 7 eggs with an average of 3 to 4 eggs. Average clutch size may increase from south to north. Females do most, if not all, of the incubating and brooding with the male bringing food and defending the nest. The incubation period is about 29 days. Unlike all other North American owls, this owl begins incubation only after the clutch is complete, so that young tend to hatch over a period of 1 to 2 days, rather than one every 1 to 2 days. Males increase delivery of food to the nest after young hatch. Young grow quickly, reaching 60% of adult size after 2 weeks. Young fledge at about 30 days, when they are capable of flight. Fledglings are then fed and defended by their parents for a further 20 to 30 days. Family groups tend to break up in late summer or autumn.

Northern Pygmy-Owls are single-brooded. It is not known if replacement clutches are laid. Nest cavities may be used for several consecutive years by the same birds.

## CONSERVATION

The Northern Pygmy-Owl does not come into conflict with man's interests so is not persecuted by people very much. It also frequents forests that are lightly-used by people. They do take more songbirds than other owl species, but also take many rodents and insects that are injurious to crops and forests.

Clearing of dense forests has probably increased habitat because they tend to inhabit edges of forests. But because they are dependent on old woodpecker cavities for nesting silviculture practices that remove snags destroys good nesting habitat.

This little owl is often mobbed by small songbirds such as chickadees, juncos, blackbirds, wrens, and hummingbirds as these birds seem to know that pygmy-owls are highly predatory on songbirds.

## REFERENCES

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Munro, J.A. 1929. Notes on the food habits of certain raptors in British Columbia and Alberta. *Condor* 31:112-116.

Webb, B. 1982. Distribution and nesting requirements of montane forest owls in Colorado. *Colorado Field Ornithologist's Journal* 16:26-32, 58-64.

# Western Screech-Owl Brown Phase

*Otus kennicottii*

## General Description

The Western Screech-Owl is a small, nocturnal, woodland owl of western North America and is one of the west's more common owls at lower elevations. It is the second smallest eared owl, after the Flammulated Owl, found west of the Rocky Mountains. It is a squat-looking owl that sits erect, its plumage fluffed out, with feet and legs obscured, and its distinct ear tufts raised. The iris is bright yellow and this owl will swivel its head into contorted positions to gain a good view because its eyes are immovable. Its bill is black, with tufts of bristly feathers around its base, and toes are yellow. Its plumage is either mainly grayish or reddish-brown (see Morphs) variegated dark and light, that resembles a furrowed tree bark pattern, and is virtually identical to the Eastern Screech-Owl. It has noticeable light spotting along the edge of the scapulars. Its facial disk is bordered by black.

## Size

The Western Screech-Owl is the same size as the Eastern Screech-Owl, about the 12th largest North American owl overall. Because of its puffed plumage it gives the impression of being larger than it is. Females are 5 to 10% larger than males. Females average 9.2 inches (23 centimeters) and males average 8.2 inches (21 centimeters) in length, respectively. Wingspans average 22 inches (56 centimeters) for females and 21 inches (54 centimeters) for males. Weights of different subspecies vary widely, from an average of 6.5 ounces (186 grams) for females and 5.3 ounces (152 grams) for males in a northern population to 4.3 ounces (123 grams) for females and 3.9 ounces (111 grams) for males in a southern population. In general, weights decrease from north to south, with northern rain forest-dwelling birds being as much as 50% heavier than southern desert-dwelling birds.

## Morphs

There are two color morphs, a gray phase and a reddish-brown phase, with much individual variation. In the gray-phase, birds in the dry southwest are a paler gray, while birds in the humid northwest are darker and browner. The red-phase is very rare and is found only in the Pacific Northwest.

## Specific Description

### Adult (gray phase)

- refer to above
- facial disks dusky white with fine gray-brown mottling
- overall gray-brown, with gray-brown narrow vertical stripes, bars, and spots on underparts, and barred wings and tail
- legs fine buff mottling

### Adult (red phase)

- refer to above
- similar pattern to gray phase except dull cinnamon instead of gray
- face buff light cinnamon
- rufous spotting on breast with black anchor marks

### Juvenile (gray and red phases)

- similar to adults but indistinct stripes and bars more patterned
- many feathers tipped with white



## Similar Species

The Western Screech-Owl is likely to be confused mainly with the Eastern Screech-Owl and Whiskered Screech-Owl. These owls can only be distinguished by their different calls. Western and Eastern Screech-Owls only occur together locally in eastern Colorado and southern Texas. Western and Whiskered Screech-Owls only occur together in southern Arizona and Mexico. The Flammulated Owl could be mistaken for this species too, but it is much smaller and darker than the Western Screech-Owl.

## Other Names

It has also been known as Puget Sound Screech-Owl, Washington Screech-Owl, Ghost Owl, Dusk Owl, Little Cat Owl, and Coastal Screech-Owl.

## Etymology

The scientific name *Otus kennicottii* translates into "eared owl named after Robert Kennicott".

## Mythology

Native Northwest coast Kwagulth people believed that owls (including this species) represented both a deceased person and their newly-released soul.

## RANGE

North America - Resident from south-coastal and extreme southeastern Alaska, coastal (excluding Queen Charlotte Islands) and southern British Columbia, northern Idaho, western Montana, northwestern Wyoming, Colorado, extreme western Oklahoma, and western Texas south to Baja California.

Subspecies - There are 8 recognized subspecies of this owl of which 5 are found in North America.

*Otus kennicottii aikeni* - eastern Nevada, Utah, and Colorado south to include most of Arizona, New Mexico, and extreme western Oklahoma.

*Otus kennicottii bendirei* - southeastern Washington, Idaho, and western Montana, most of Nevada south to southern California. This race now includes both *macfarlanei* and *quercinus*. Birds found in southern Alberta are undetermined.

*Otus kennicottii kennicottii* - coastal and extreme southeastern Alaska, British Columbia including Vancouver Island, northern Washington, and coastal Washington and Oregon.

*Otus kennicottii suttoni* - occurs only in the Big Bend area of Texas.

*Otus kennicottii yumanensis* - locally distributed in extreme southeastern California and western Arizona.

The Western Screech-Owl also occurs in Baja California, northern Sinaloa and across the Mexican highlands through Chihuahua and Coahuila as far as the Distrito Federal.

## BEHAVIOR

During direct flight, the Western Screech-Owl flies fairly rapidly with a steady wing beat, about 5 strokes/second. It rarely glides or hovers, but may fly bat-like with erratic movements, when maneuvering through wooded areas. Wings are broad and the head is held tucked in giving a flying bird a stubby appearance.

It hunts at night, from dusk to dawn, before retiring to daytime roosts. It searches for prey mainly while in flight, rather than from a perch. When prey is spotted, the owl dives quickly and seizes it in its talons. It also captures flying insects on the wing. Small prey is usually swallowed whole on the spot. Larger prey is carried in the bill to a perch and then torn apart.

The Western Screech-Owl is essentially non-migratory. Adults tend to remain near their breeding areas year-round while juveniles disperse in the autumn.

Small territories around nest sites are vigorously defended by males. In desert riparian areas of the southwest, where this owl can be quite numerous, territories may be only 165 feet (50 meters) apart. There is no information on territory size in northwestern rain forests. Home ranges are much larger, and range from 7.5 to 150 acres (3 to 60 hectares), but these are not defended and there is much overlap between pairs.

Predators of this owl include Northern Goshawk, Cooper's Hawk, Great Horned Owl, Barred Owl, Spotted Owl, Long-eared Owl, Great Gray Owl, Short-eared Owl, mink, weasels, raccoon, skunks, squirrels, snakes, and crows. Cannibalism by other screech-owls also occurs.

During courtship males and females call, duet-style, as they approach each other. When together they preen each other's heads and nibble at the other's beak. The male then changes his call to a rapid tremolo, answered with a short, tremolo from the female. After a series of these duets, the male copulates with the female.

#### Adaptations

It is the largest and most northerly of all the screech-owls. Uses variegated plumage as camouflage. When threatened, it stretches body and tightens feathers in order to look like a branch stub to avoid detection, but will take flight when it knows it has been detected. Like all owls, it has exceptional hearing, that aids in nocturnal hunting. Its eyes are more adapted for diurnal vision than any other screech-owl. Nests are kept cleaner than in Eastern Screech-Owls. The Western Screech-Owl can be very aggressive and will attack larger owls, other birds, or mammals when protecting nests or defending itself. It can be very tame when handled by humans.

#### HABITAT

The Western Screech-Owl inhabits a wide variety of habitats throughout its range. On the northwest coast, it inhabits humid Douglas-fir, western hemlock, western red cedar, and Sitka spruce forests along the edges of clearings, rivers, and lakes. Further inland it occupies a narrow ecological niche of lowland deciduous forests, especially riparian woodlands along river bottoms. Southern populations inhabit lowland riparian forests, oak-filled arroyos, desert saguaro and cardon cacti stands, Joshua tree and mesquite groves, and open pine and pinyon-juniper forests. It avoids dense forests because Great Horned Owls use that habitat, and high elevation forests. It hunts mainly in open woodlands, along the edges of open fields or wetlands, or makes short forays into open fields. In general it requires open forests, with an abundance of small mammals and insect prey, and cavities for nesting. It roosts mainly in natural or woodpecker cavities in large trees. It will also roost in dense foliage of deciduous trees, usually on a branch next to the trunk, or in dense conifers.

#### VOICE

The male's most common call is a mellow, muted trill "hoo-hoo-hoo...", or bouncing ball song, that speeds up at the end, but maintains a constant pitch. This call differs markedly

from the Eastern Screech-Owl and Whiskered Screech-Owl calls. It is given by the male during the mating and nesting seasons, but also during the autumn and winter. This call is primarily territorial in nature. A secondary song is a double trill of rapid bursts. Other calls are a soft "cr-r-oo-oo-oo-oo" given as a greeting call, and a sharp bark given when excited.

## PELLETS

Pellets are medium-sized, averaging about 1.5 by 0.75 inches (3.8 by 1.9 centimeters). Pellets are compact, dark gray, ovals that are composed of fur, feathers, bones, teeth, and chitin. Two to 4 pellets are cast each day.

## FOODS

An extremely wide range of prey species is captured. Its most favored prey are small microtine rodents and deer mice, larger insects, or small birds depending on abundance. On southern Vancouver Island, it eats mainly small rodents and shrews during the winter, but mainly beetles, larval moths and butterflies, and orthopterans at other seasons. In Washington it eats mainly mice, insects, crayfish, worms, and birds. In Puget Sound, it eats mainly arthropod insects, and birds. In Utah, it favors birds, insects, and small mammals. In California, it eats mainly House Sparrows, pocket gophers, voles, salamanders, and beetles. Further south, it takes kangaroo rats, wood rats, pocket mice, grasshopper mice, gophers, frogs, locusts, and scorpions. Other foods include earthworms, snails, small fishes, frogs, poultry, and barnyard ducks.

## NESTING

The Western Screech-Owl nests almost exclusively in tree cavities. Enlarged natural cavities are preferred but it will also use old Pileated Woodpecker and rotted-out Northern Flicker cavities. Nest cavities are usually 4 to 5 inches (10.2 to 12.7 centimeters) wide and are usually shaded from bright sunlight. Nest cavities are usually 6.5 to 20 feet (2 to 6 meters) above the ground, but may be up to 50 feet (15 meters) up. This owl will readily nest in suitable nest boxes. Nests are almost always in deciduous trees such as oaks, cottonwoods, maples, sycamores and large willows, but also in large cacti, Douglas-fir snags, and junipers. One subspecies in Arizona nests exclusively in saguaro cacti.

No nest material is added. Eggs are laid on natural sawdust on the floor of the cavity. Clutch size ranges from 2 to 5 eggs, averaging 3 to 4 eggs in most areas. The average clutch size tends to increase from south to north and from the coast inland. Eggs are laid every 1 to 2 days and incubation begins after laying of the first egg. The incubation period is about 26 days and the fledging period about 35 days. Females incubate eggs and brood young while males bring food to the nest.

The Western Screech-Owl is single brooded, but may re-nest if first clutches are lost. Pairs will often reuse nest sites in consecutive years. Pairs mate for life but will accept a new mate if the previous mate disappears. Gray and red color phases will mate together.

## CONSERVATION

The Western Screech-Owl is dependent on deciduous woodlands or open mixed forests that have suitable nesting sites (large trees with natural or woodpecker cavities) and sufficient prey densities. Removal of riparian forest in drier regions will cause population declines because most densities are highest in riparian zones. However, this adaptable owl can survive in wooded suburban areas and city parks as long as they are not directly persecuted. Populations likely fluctuate more depending on prey availability.

Nest box programs can enhance local populations, especially in areas short of suitable tree cavities. Silviculture practices that include removal of dead and dying trees can eliminate this bird as a breeding species from local areas. This owl tends to avoid areas inhabited by Great Horned Owls.

The Western Screech-Owl feeds mainly on small rodents and flying insects that are considered injurious to agricultural or forestry crops. Its depredation on songbirds is relatively insignificant because birds comprise a very small percentage of its diet.

#### REFERENCES

- Campbell, R. W., N. K. Dawe, I. McTaggart-Cowan, J. M. Cooper, and G. W. Kaiser. 1990. The birds of British Columbia - volume II (Diurnal birds of prey through woodpeckers). Royal British Columbia Museum, Victoria. 636 pages
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# Western Screech-Owl - Gray Phase

*Otus kennicottii*

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#### Adaptations

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#### VOICE

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## PELLETS

Pellets are medium-sized, averaging about 1.5 by 0.75 inches (3.8 by 1.9 centimeters). Pellets are compact, dark gray, ovals that are composed of fur, feathers, bones, teeth, and chitin. Two to 4 pellets are cast each day.

## FOODS

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## CONSERVATION

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## **Color Phases**

[Eastern Screech-Owl - Gray Phase](#)

[Eastern Screech-Owl - Red Phase](#)

[Flammulated Owl - Gray Phase](#)

[Flammulated Owl - Red Phase](#)

[Great Horned Owl - Dark Phase](#)

[Great Horned Owl - Pale Phase](#)

[Northern Pygmy-Owl - Gray Phase](#)

[Northern Pygmy-Owl - Red Phase](#)

[Western Screech-Owl - Brown Phase](#)

[Western Screech-Owl - Gray Phase](#)

