

Owls Of Alaska

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Pictured on right Barred Owl, Great Horned Owl, and Great Gray Owl

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Introduction

This paper will talk about the 10 different species of owls found across Alaska. They range from one of the smallest owls in the world to the largest owl in North America. There will be species fact sheets about each native owl as well as general facts pertaining to all owl species. Owls are known to be elusive creatures that tend to be heard but not seen. Within this paper you will be able to see and learn about our native species and all their interesting habits.

Owl Hearing

Owl hearing is some of the finest hearing in the animal kingdom. Believe it or not owl ears are actually not located symmetrically as they are on other animals, but rather are asymmetrically located. Some owls have feathered tufts that sit atop their head and seem as if they are functioning ears; like the great horned owl.



These are not ears at all they are just feathers called ear tufts, that they can voluntarily raise and lower. They typically have a high right ear and a low left ear. The more nocturnal the owl is the more asymmetrical the ears, the more diurnal the more symmetrical they are. The advantage of having a high and low ear are numerous. One advantage is they can pinpoint the exact location of their prey. Owls have a circular like “disk” of feathers on their face called a facial disk. The ears are located on the edge of the facial disk right behind the

ruff, which is typically a darker color circling the disk. The facial disk acts like a funnel to channel the sound to the ears. Owls can change the shape of this disk when needed to focus sound waves and thereby determine the correct location of their prey. In conjunction with the facial disk owls have a downward pointing bill which helps increase the surface area allowing sound waves to be collected by the facial disk with more ease. The owl will move its head left or right, up or down, etc., until they have their prey precisely located. Owls can distinguish a left to right differential as brief as 30 millionths of a second. They can then proceed to make

the final kill.

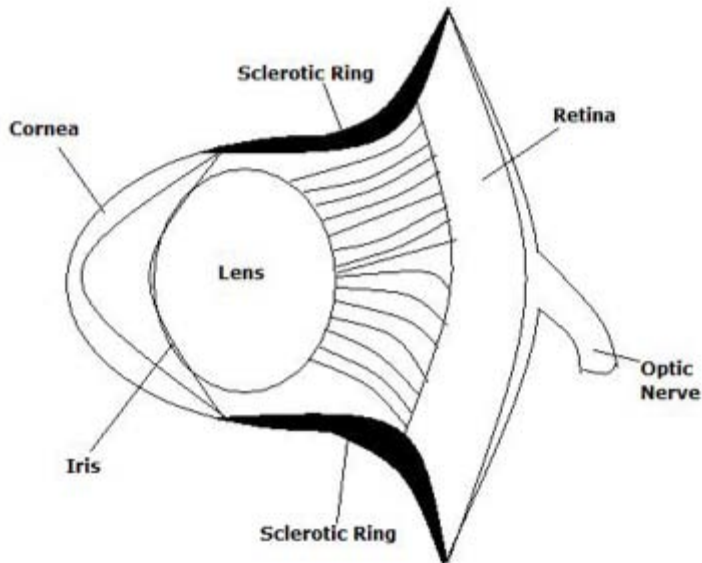
Studies have been conducted with barn owls to see just how acutely they hear. When in a pitch black room the barn owl was able to locate and kill a mouse with no problem. Testers then placed a cotton ball with a string attached and moved it across the floor, only to find the owl made another clean kill. Thusly, owls depend mostly on hearing to locate their prey and not their eyesight as do the falconiformes.

Owl Eyesight

The owls' eyesight is especially acute at night. Owls have completely different eyes than humans and falconiformes. Owls are known for their large striking eyes. Owls eyes are so large they can weigh 1%-5% of their total body weight. Strigiformes, or owls, have an eye shape described as tubular. Their tubular eyes are held in place by bones called sclerotic rings. The eye and bone sit right against each other leaving little to

no room for muscles, resulting in owls having no significant eye movement. Owls cannot keep their head immobile and move their eyes left or right. They have to move their whole head if they want to look in another direction because of their fixed eyes. To allow this, owls have 14 cervical vertebra compared to humans which have only 7 cervical vertebra. These are the bones that make up the neck. Because of these 14 cervical vertebra they

can rotate their head an astounding 270 degrees either way but not the full 360 degrees most people think they can. Owls only have about 70 degrees of binocular, or three dimensional vision, while humans have approximately 140 degrees of binocular vision. Owl's eyes contain mostly rods. Rods are the cell type that allow you to see black, white, and gray. They collect most of the light for definition in shapes and objects. Although they have an abundance of rods, owls have very few cones. Unlike human eyes which have an abundance of cones, and see in color.



Owls see in limited color or in monochrome. This is beneficial for owls though, because they are typically night hunters and have astounding night vision. Some



Great Gray Owl with Nictitating Membrane

people have postulated that due to the rod and cone values found in owls eyes they are possibly blind in sunlight, this is false. Owls have pupils that have a wide range of adjustment allowing for just the right amount of light into the eye. Owls have three eyelids; an upper lid, a lower lid, and a nictitating membrane. The upper lid is normally used for blinking. while the lower lid is used to assist in sleeping. The nictitating membrane functions almost like a “windshield wiper” for an owls eyes. This membrane keeps the eyes clean and moist during flight and at rest. This layer closes diagonally across the eye and is normally

bluish in color. One interesting fact about the eye is that it takes up so much space in the owl's head that in some owl species the back of the eyeball can be seen by looking through the owl's ear.



Owl Smell

Owls have little to no sense of smell. It is believed this is to assist in what they eat, i.e. dead animals, and just about any kind of meat. Some owls, such as the great horned owl, can eat skunks because of their lack of smell. They do have nares, which aid in the respiratory system, but not smell.

Owl Feathers

Owls have multiple different kinds of feathers. Owls, like other raptors, have both primary and secondary flight feathers. Primary feathers are used for propelling the bird through the air in a forward motion. Secondary feathers provide uplift. Owls also have rectrices, or tail feathers, that have the function of “steering”, like the rudder of a plane. Owls have soft leading edged primary feathers that aid them in silent flight. You usually can not hear an owl fly. This adaptation has happened due to owls being slower fliers. Unlike hawks or falcons who move up to 240 mph, depending on species, owls move much slower. They have adapted this silent flight to help them catch their prey with more ease. They also have feathers called alula. These feathers aid in the landing maneuver. Additionally, the owl's body is covered in contour, semiplumes, filoplumes, and down feathers. Contour feathers cover the body and wings, these feathers determine the owl's shape. They also help by reducing turbulence to assist in silent flight. Semiplumes function by filling in the gaps between the contour and down feathers. Down feathers trap air against the owl's body to create a layer of “insulation.” Filoplumes are small sensory feathers that have a very fine shaft that ends with a few barbed receptors. Their objective is to sense the location of other feathers so they can move them into the correct positioning. Owls also have special feathers around their bill and sometimes their eyes, called rictal bristles. Rictal bristles aid the bird in sensing what is close to their face, for instance their catch or that pesky branch. Owls are “functionally” farsighted due to their inability to converge their eyes at near point, thusly, rictal bristles aid in determining close object identity. All feathers have a rachis or shaft, which is the central “root” of the feather, like the trunk of the tree. The point at which the shaft enters the skin is called the calamus. On either side of the rachis is the vane which is made up of barbs that hook



together. Barbs have pin like branches called barbules growing off them. Branching off the barbules are barbicels, these are so tiny you have to use a high powered microscope to see them.

Birds go through a molt each year. This is when they drop or “shed” their old worn out feathers and grow new beautiful feathers. During this process they get what are called blood feathers. Blood feathers have large amounts of blood flowing into the newly forming feather.



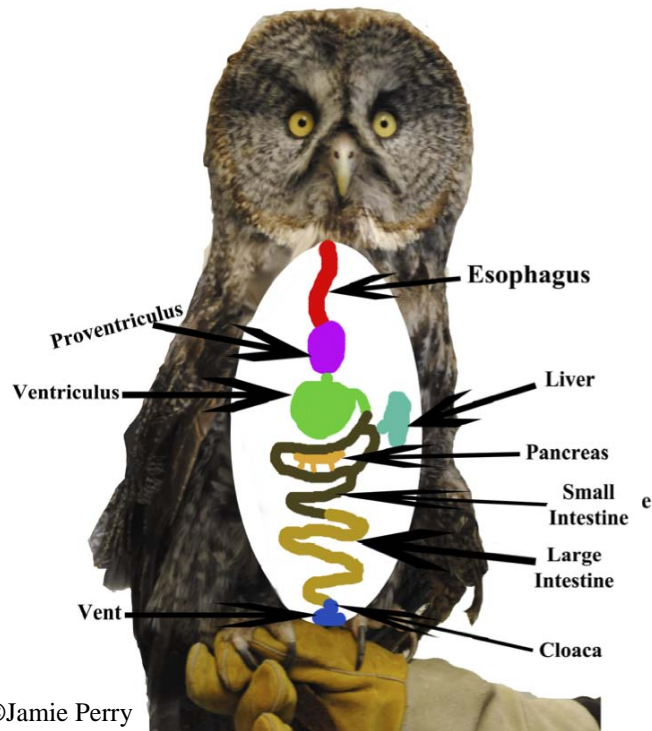
Rictal
Bristles
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Owl Digestion

An owl's digestive system is very different than the human digestive system. Owls have a two chamber “stomach” which consists of a proventriculus, or glandular stomach and a ventriculus. The function of the proventriculus is to produce enzymes, mucus, and acids that start the digestion process.

Eagles, hawks, and falcons have a loose sac in the throat called a crop, owls do not have this special food storage adaptation. Instead, their food passes directly into their digestive system. An owl has to cast a pellet, or regurgitate it, before it can consume additional food due to the lack of the crop in the digestive system. They also cannot chew their food, instead, they swallow it whole or rip it into smaller pieces. After passing through the proventriculus the food passes into the ventriculus, also known as the gizzard. This is where the food is “blended” down.

The ventriculus has no digestive



acids, instead it acts almost like a filter, letting the soluble, or soft digestible tissues, through and preventing the insolubles, such as fur, teeth, feathers, bones, etc., which “ball up” and create a pellet. After the pellet is created in the gizzard it passes back up into the proventriculus and can remain there for up to 10 hours. If the owl consumes more than one prey item within a few hours of each other the residues will all combine into one pellet in the gizzard.

From there the solubles pass into the small then large intestine where they are absorbed into the body by digestive enzymes secreted by the pancreas and liver. The solubles finally come to the end of the digestive track which is called the cloaca, or the holding area for waste products. The cloaca expels the waste by opening outward, through an opening called the vent. This cycle is typically quite regular and can happen many times daily.

Owl Talons

Owls feet differ from falconiformes' feet. Falconiformes are anisodactyl, meaning they have three talons in front and one talon in back, called the hallux. Strigiformes, owls, are zygodactyl, meaning they have two talons in front and two talons in back. Owls can actually rotate their outer talon as well to create three talons in front and one talon in back. Only osprey and owls share this unique style of foot. Researchers believe they have adapted to have zygodactyl feet because they are primarily perched predators. Owls stand the majority of the day, and it is believed their unique talons help disperse the pressure of standing, also serving to deter a life threatening condition called bumblefoot. Bumblefoot is a bacterial infection of the pad of their feet causing it to become tender and inflamed.



Not only are owl's talons razor sharp, they are also extremely strong. This strength is what truly makes the final kill. For example, a great horned owl can exert around 500 psi to the tip of their talons, a strong human man has about 5 psi in his hands. This strength works in conjunction with their talons to lock on their prey, sink their talons in, and make a successful kill.



Barred Owl

Barred Owls are found from southeast Alaska, through southern Canada over to the east coast and down to Florida. They can be spotted in the Pacific Northwest as well. Barred owls primarily feed on small mammals, like mice and voles, but are also opportunistic creatures. They will often feed on amphibians and various invertebrates, during spring they especially love to feed on frogs. Barred owls display reverse sexual dimorphism like most other raptors. Males are typically 500-800 grams and females range from 800-1100 grams, with a typical wingspan of 39-44 inches. Barred owls become mated pairs and produce 2-4 eggs per clutch. They prefer to take over abandoned nests of other animals, such as crows, red-tailed hawks, or even squirrel nests. The female does the bulk of the incubation which lasts 28-30 days. After hatching the young begin branching, or leaving the nest, at 4 weeks. The young fledge by 6 weeks of age.

Barred Owl (*Strix varia*)



Range Map:



Boreal Owl (*Aegolius funereus*)



Range Map:



Boreal Owl

The Boreal Owl is found from the interior of Alaska down through Canada over to its east coast. They prefer boreal forests alive with spruce, alpine, fir, and birch trees. They sit quietly high in trees and wait for their prey to come to them. They prefer small mammals, like voles and mice, but they also eat insects and small birds. Due to their outstanding hearing they can dive down on their prey, without ever seeing it, and retrieve it successfully. They are considered a small owl, weighing in at 95-210 grams, with females being much larger than males. Typical wingspan is 21-25 inches and they stand 8-11 inches tall. The male will choose a cavity in a tree or nest box to set up his nest. He will then fill it with various prey items. After he feels it is ready he stands by the nest and calls out to the females. If a female accepts his nest she will stay. She incubates the eggs for 28 days while he brings her food. The young begin to fledge at 30-32 days. After nine months they are mature. 7-8 years is the typical lifespan in the wild for the boreal owl.

Great Gray Owl

The Great Gray Owl is a northern owl, found throughout parts of the Pacific Northwest, Canada, and up into the interior of Alaska. These large owls are the tallest owls in North America, being able to reach 24-33 inches in height. However, they are not the heaviest, males can be 800-1100 grams and females 1100-1500 grams. Great gray owls have small feet in comparison to their bodies, causing them to be picky about their prey species. They prey on voles, small mice-like mammals. Great gray owls sit high in trees and listen for the voles, who are scurrying under the snow. Once the owl locks in it will dive down and plummet into the snow pack, being able to penetrate up to two feet deep, and retrieve their prey successfully. Not only can they do this, but they can break through a snow pack that would support a 180 pound man. This is called a “snow plunge.” Great gray owls lay between 2-5 eggs per clutch in a nest high in the trees. Incubation is 28-32 days, with fledging occurring only 8 weeks after hatching.

Great Gray Owl (*Strix nebulosa*)



Range Map:



Great Horned Owl
(*Bubo virginianus*)



Range Map:



Great Horned Owl

The Great Horned Owl is the most widespread owl of North America, spanning from the tip of Florida all the way to the interior of Alaska. Controversy exists as to which owl is the heaviest owl of North America, the snowy owl or the great horned owl. The great horned owl is considered to be one of the contenders. Females may weigh as much as 2000 grams, although some males can be as light as 1100 grams. Great horned owls make the signature owl “hoot” with which most people are familiar. They are very diverse in their eating habits, they prefer small mammals but will consume almost anything. Great horned owls are one of the few animals that actually consume skunks on a regular basis. Being one of the first raptors to nest, this permits them to have the pick of existing nests. Great horned owls do not build their own nest but rather take over nests of other raptors. Females do the majority of the incubation which lasts 26-30 days while the male supplies her with food. The owlets begin branching at 6-7 weeks of age. Although, they cannot fly well enough to fledge until about 9-10 weeks.

Northern Hawk Owl

The Northern Hawk Owl is found from the western part of Alaska, through its interior, down to southeast Alaska, and over to the eastern coasts of Canada. They are a medium sized owl with males being typically 260-325 grams and females being 310-420 grams in weight, with an average wingspan of 22-28 inches. Preferable habitat is mixed forest areas and coniferous woodlands. They enjoy sitting at the tops of trees as an overlook for finding their pray. Unlike most other owls the northern hawk owl is diurnal and also hunts using its eyesight. Although, their eyesight is phenomenal they still have outstanding hearing and have been seen diving up to one foot in the snow to obtain their prey. Males advertise potential cavity nests until the female accepts one. After she accepts a cavity she will lay 5-13 eggs asynchronously. She will do all the incubation while the male brings her food, this lasts about 25-30 days. After hatching, the young begin to leave the nest by the age of 23-30 days old. After only 5-6 weeks they can fly quite well.

Northern Hawk Owl (*Surnia ulula*)



© Phil Brown

Range Map:



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Northern Pygmy Owl

(*Glaucidium californicum*)



© Jared Hobbs

Range Map:



© Jared Hobbs

Northern Pygmy Owl

The Northern Pygmy Owl is found throughout southeast Alaska, spanning down through parts of Canada, California, Arizona, and Colorado. They prefer dense forests or woodland habitats with mature growth trees, making it easy for them to stay hidden in the thickets of the trees. Pygmy owls are considered a small owl with males weighing from 55-75 grams and females from 65-90 grams. Typical wingspan is 12-15 inches. The northern pygmy owl feeds primarily on small mammals such as shrews and voles. They will also eat small songbirds. They sit in trees and wait for their prey to come to them. In relation to other owls the pygmy owl has noisy flight due to their fast beating wings. Their veracity allows them to kill prey much larger than themselves. Pygmy owls become mated pairs and lay 3-5 eggs asynchronously per clutch. Unlike, other North American owls the pygmy owl doesn't begin incubation until all the eggs are laid, this causes all the eggs to hatch within 24-48 hours of each other. Incubation lasts about 29 days. At only 14 days of age the fledglings are already at 60% of their adult weight and by their 25th day they are fully feathered. 30 days after hatching the owlets begin to fly. They continue to stay with their parents for 20-30 additional days before natal dispersal takes place.

Northern Saw-Whet Owl

The Northern Saw-Whet Owl is found throughout parts of southern Alaska, southernmost parts of Canada, Washington down to California and over to parts of Colorado and New Mexico. Forest areas are their preferred habitat. Unlike most other owls the northern saw-whet owl is migratory, moving further south to warmer climates in the winter months. They are a smaller owl with males being only about 55-95 grams and females larger at 65-125 grams. Saw-whet owl's average wingspan is 16 to 18 inches with a relatively short lifespan of only 5 years in the wild. They feed primarily on small mice or voles, but have been known to feed on smaller birds and sometimes insects. Saw-whet owls are vocal owls during the breeding months, March to May, but are otherwise almost mute during the wintering months. They make a variety of vocal sounds, males make 2 typical sounds. They seem to make an "advertisement" song, or courtship call, to lure in their prospective mate. The second is a combination of "whoop" or "kwook" sounds uttered in 3 notes per 2 seconds. Females and males become mated pairs. They take over other bird's nests, most commonly flickers or old woodpecker cavities, and lay a clutch of 4-7 eggs asynchronously. The females do the majority of the incubating with the males doing most of the hunting. Incubation time is roughly 26-28 days. After an additional 30 days the young begin to fledge, or leave the nest.

Northern Saw-Whet Owl (*Aegolius acadicus*)



Range Map:



Short Eared Owl (*Asio flammeus*)



© Phil Brown

Range Map:



Short Eared Owl

Short Eared Owls are one of the few migratory owls of North America. During the summer they can be found throughout Alaska, northern parts of Canada, and parts of the Pacific Northwest. In the winter months they are seen in parts of the lower 48 west coasts and east coasts, including some states in between. Year round they can be found in parts of Washington, Oregon, Nevada, Montana, Wyoming, and a few states in-between. They prefer open country such as marshes, prairies, tundra, fields, and muskegs. Short eared owls are crepuscular, meaning they prefer to hunt during dawn and dusk hours. Their common prey is small mammals, such as mice or voles, but they will occasionally take small birds too. Unlike most other owls, the short eared owl nests on the ground. They construct their nests typically under a grass mound or among herbaceous ground cover. The female scrapes a spot in the ground then lines it with feathers plucked from her breast, herb stocks, and grass stocks. She will lay between 4-14 eggs per clutch. After hatching the young grow very quickly, at only about 12 days of age they wander away from the nest, and at 4 weeks they fledge. Due to high predation rates a female will sometimes brood two clutches in a year.

Snowy Owl

Snowy Owls are found primarily in the northern parts of Alaska but have been seen, during winter months, as far south as Michigan. They are in a heavyweight controversy with the great horned owl but generally considered to be one of the heaviest owls in North America, being able to attain weights of 1100-2000 grams, which is about 2.5-4.5 pounds. They however, only reach about 23 inches in height with a wingspan of 54-65 inches. Unlike most other raptors snowy owls plumage varies between male and female. Young and female snowy owls are heavily barred but the male is almost pure white in contrast. Snowy owls are considered to be diurnal owls; doing the majority of their hunting in the daylight. They feed primarily on lemmings and voles due to their geographic location. When food is scarce they are very opportunistic hunters, and will snatch up anything from prairie dogs, to fish, or even other owls. Snowy owls nest on the ground. Females will scrape the ground with their talons to create an indentation, then line it with their feathers and neighboring vegetation. Their clutch size depends heavily on the supply of food in that year, in some cases they will not nest if food is too scarce, but a typical clutch size ranges from 5-8 eggs. The female does the majority of incubation which lasts 32-34 days while the male supplies her with food. After hatching the young fledge at only 50-60 days of age.

Snowy Owl (*Bubo scandiacas*)



© Phil Brown

Range Map:



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Western Screech Owl

(*Megascops kennicottii*)



Western Screech Owl

The Western Screech Owl is found primarily west of the Mississippi river spanning over to the pacific coast and up to southeast Alaska. Suitable habitat is usually open woodlands with tree cavities for nesting and protection. They are a smaller owl being merely 130-250 grams with a wingspan of 20-25 inches. Typical lifespan for the western screech owl in the wild is 10 years. The western screech owl comes in two color phases, a mottled gray and a subdued reddish phase. At one time the western and eastern screech owls were considered to be the same species until multiple differences in range and appearance became apparent. For example, the western screech owl's bill is almost always black while that of the eastern screech owl appears to be a subdued yellow. Western screech owls prey primarily on small mammals, such as mice and voles, insects, worms, and smaller songbirds. They have been known to sometimes take prey larger than themselves but not as often as other owls. A typical clutch is 4-6 eggs. The incubation period is around 26 days, with fledging being an additional 30-32 days. Currently, they are listed as vulnerable to habitat loss due to urban development.

References:

The Owl Pages: www.owlpages.com

The Cornell Lab of Ornithology: www.allaboutbirds.org

The Alaska Department of Fish and Game: <http://www.adfg.alaska.gov/>

The Barn Owl Center: http://www.barnowl.co.uk/upload/docs/593/hearing_capabilities.pdf

Book: North American Owls, Biology and Natural History. Author: Paula A. Johnsgard © 2002
Smithsonian Institution Press

Book: Owls of North America: Author: Frances Backhouse © 2009 Grant McCreary

Book: The Sibley Guide to Birds. Author: David Allen Sibley ©2000 Chanticleer Press, Inc

Book: Birds in Flight. Author: Carrol L. Henderson ©2008 Voyager Press

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