

Owls: Formidable predators of the Kenai Peninsula

by Toby Burke

Late winter is the time of the year when residents of the Kenai Peninsula often become aware of our resident owls. Why? Because their annual breeding cycle begins a new when owls start vocalizing to attract mates and establish and defend breeding territories. There are eight species of owls that frequent the Kenai Peninsula either as winter visitants, summer breeders, or year-round residents. They are Great Gray Owl, Great Horned Owl, Snowy Owl, Short-eared Owl, Northern Hawk Owl, Boreal Owl, Northern Saw-whet Owl, and Western Screech-owl. While most species of owls can be characterized as nocturnal and a few as diurnal almost all of our owl species are crepuscular to some degree, exhibiting increased activity during the morning or evening twilight periods.

Owls belong to the order Strigiformes of which there are about 225 species world wide. Traditionally, ornithological systematists considered owls, as nocturnal birds of prey, to be the closest relatives to the order Falconiformes composed of diurnal birds of prey such as eagles, hawks, and falcons. But new taxonomy based on DNA-DNA hybridization has revealed that owls may be more closely related to the order Caprimulgiformes composed of whippoorwills, nighthawks, and their allies.

The world's largest owls, Blakiston's Fish Owl, the Eurasian Eagle Owl, and Verreaux's Eagle Owl, are all old world species. The females of each species may approach weights of 10 pounds, wingspans of nearly 6 feet and lengths of nearly 30 inches. On the other end of the spectrum, the world smallest owls are the Least Pygmy Owl of South America and the Elf Owl which inhabits Mexico and neighboring U.S. Border States. The Elf Owl typically measures 4.8 to 5.5 inches in length and weighs 1.3 to 1.9 ounces. It's equivalent in size and weight to a large sparrow.

Having evolved as predators of low light conditions, owls have several physical adaptations that make them fearsome hunters. Foremost, they have exceptional vision and hearing, they can fly silently, and they have powerful talons.

Owls have large forward facing eyes giving them stereoscopic, or three dimensional, vision like humans. Unlike humans though, their eyes are relatively large

accounting for an incredible one to five percent of their total body mass, depending on the species. Their proportionately large eyes improve their sight especially under low light conditions by enabling them to collect more light. The eye itself contains an abundance of "rod" cells that aid them in processing the light. These cells are very sensitive to light and movement. Cells that are very sensitive to color are known as "cone" cells. Owls possess few cone cells and these cells are not very sensitive in low light conditions so most owls see in limited color or in monochrome.

Furthermore, the exceptional light gathering ability is enhanced by the reflective layer behind the eye called the tapetum lucidum. This layer reflects back onto the rod cells any light that may have passed through without hitting them the first time. The old world Tawny Owl is generally acknowledged as having the most well developed night vision not only among owls but probably all vertebrates and it is believed that their night vision is approximately 100 times more sensitive than a human's.

An owl's well developed eyes are not really eye "balls" as much as they are elongated tubes held in place by a boney structure called a sclerotic ring. Accordingly, they cannot be rolled or moved as humans move their eyes. An owl must rotate, raise, or lower its entire head to move its eyes. This is compensated by the owl's 14 cervical vertebrae, twice as many as humans, which allow it to rotate its head 270 degrees from side to side and turn its head straight up if desired.

The ears on an owl are located on the sides of the head. They are covered by the feathers of the facial disk which directs the sound waves toward the ear. In strictly nocturnal species the ear openings are set asymmetrically or unevenly to enhance their ability to triangulate the specific location or direction of the sound. If one were to look at the bare skull of one of these owls it would appear slightly lopsided. These owls also have a more pronounced facial disk that can be manipulated using its facial muscles to more efficiently direct sound waves into the ear in addition to altering the position of the head. The "ear tufts" found on "eared owls" are not ears at all but simply feathers

used for display.

The pinpoint accuracy of an attacking owl on its invisible prey is derived by its ability to discern left ear—right ear differences of about 30 millionths of a second. Owls use their remarkable auditory system to detect movement or vocalizations of its prey under organic debris, foliage, or snow and its range of hearing is similar to that of a human but it is more acute at detecting certain frequencies, those of its prey species.

The most unique adaptation of owl plumage is the flutings or fimbriae found on the leading edge of primary feathers of the wing. These comb-like structures disturb and thus reduce the turbulence that normally forms over the surface of a bird wing creating the distinctive rushing or swooshing sound of flight. The owl's fimbriae dampen this noise of flight and allow the owl to effectively fly in silence. Silent flight allows the owl to capture prey by stealth and also allows it use its hearing to locate or relocate prey as it flies. Several strictly diurnal owl species have lost this adaptation.

An owl's foot has four toes and a unique flexible joint. When the owl is perched or grasping prey two toes face forward and two face rearward. When fly-

ing the outer rear toe on each side swivels around to face the front so three toes are facing forward and one rearward. The talons are spread wide when the owls is attacking to increase the likelihood of contacting its prey. The bones of its feet are much stronger than most birds in order to withstand the force of impact as it strikes and initially stuns its prey. The underside of the foot also has a coarse, nubbly surface that helps it grip its prey and perch. Like most raptors, owls have talons with a mechanism that locks and ratchets down on their prey or perch avoiding the fatigue of continuous muscular contraction.

Keep all these remarkable adaptations in mind the next time you hear an owl calling through the gloom of night and be aware that a formidable winged predator is alert and on the prowl.

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