

Raptor Facts

What Makes a Bird a Raptor.

It's hard to believe that a golden eagle, with a six-foot wingspan, could have anything in common with a fast moving, four inch hummingbird. All birds, even those as different as a golden eagle and a hummingbird, share some common traits, such as feathers, wings, laying eggs and being warm-blooded. However, there are certain characteristics that set the group of birds called raptors apart from other birds.

The word raptor comes from the Latin word "rapere" which mean to seize or plunder. Today, the word is used to describe a group of birds also known as birds of prey. In Idaho, 31 species of raptors can be found. Seventeen species of diurnal raptors (hawks, eagles, and falcons) and 14 species of nocturnal raptors (owls).

Raptors are characterized by a hooked beak, strong feet with sharp talons, keen eyesight, and a carnivorous diet.

Hooked Beak - The raptor's beak sets it apart from other birds. All raptors have the same beak design, curved at the tip with sharp cutting edges to rip and tear apart their prey. Falcons use their beak to kill their prey by severing the spinal cord.



Sharp Talons - Birds of prey have powerful leg and toe muscles that terminate with sharp talons, making their feet lethal weapons. Their feet are perfectly designed to catch, hold, and carry prey. The length and size of a raptors toes, and the curvature and thickness of its talons are related to the type of prey it pursues. Most birds of prey have three toes pointing forward and one pointing backward. These toes can apply an extremely powerful grip on their prey, literally crushing it to death. The talons may also kill the prey by piercing the soft tissue and vital organs. Osprey, like owls, have one hinged toe that can be held in a forward or back position. This allows them to hold fish with two talons on each side for a secure grip. Osprey also have spiny scales on their feet that help them hold slippery fish more securely.



Keen Eyesight

- Raptor's have very keen eyesight due to the relative size of the eyeball in proportion to their head, eye muscles designed for rapid focus, and the high resolution of the retina. Diurnal raptors have full color vision and two concentrations of sharp vision on the retina. This sharpest point of vision is called the fovea. When the raptor's two fovea work in unison, they give them very accurate depth perception which aids catching moving objects.

Nocturnal raptors, like owls, have an added advantage of remarkable night vision. Owls have a concentration of rods in their retina that are used to see in low light conditions. An owl's eyes are also located in the front of their heads, much like humans, giving them a larger area of binocular vision.

Carnivorous Diet - Although the diet varies from species to species, all raptors are meat eaters. Peregrine falcons feed mainly on water fowl while prairie falcons take mostly small mammals. Some species have a very strict diet like the snail kite found in Florida which eats only *Pomacea*, large, fresh-water snails. Great horned owls, on the other hand, are known to eat over 250 different kinds of animals.

More Interesting Facts

Size Difference - Female raptors are generally larger than the males. The reason for this size difference is really unknown, but scientists theorize that it could relate to the female spending more time on the nest and can protect the young from larger predators. Another idea for this difference is that it allows for a greater diversity of prey to be taken by the adult pair.

Eyes - Raptors have three eyelids! They have a top and bottom eyelid plus a third, transparent eyelid which closes laterally across the eye. This special eyelid is called a nictitating membrane and is used to •

- keep the eyes moist,
- protect the eyes during flight, and
- protect the eyes when feeding themselves or their young.

When humans close their eyes to blink or sleep the upper eyelid closes. Depending on the

species, raptors may close the top eyelid, the bottom eyelid, or both.

An additional form of eye protection in many raptors is a bony shield, called the superciliary ridge, that projects above the eye. This ridge acts like a visor for protection from the sun and also protects the eyes from injury while hunting. It also gives raptors a menacing appearance.

Nests - Nesting habits of raptors vary among species. Some examples of these differences include:

- not building a nest, but using stick nests or cavities created by other birds,
- nesting and laying eggs in sand or gravel, depressions, or scrapes,
- nesting and laying eggs on the ground,
- nesting and laying eggs on cliff faces or in treetops,
- nesting and laying eggs in ground burrows of mammals (burrowing owls).

For raptor species that build nests, typically the female constructs the nest while the male provides the material. Many raptors build a new nest each year, while others, particularly large raptors, will reuse old nests or alternate between a number of nests.

Eggs - Raptor eggs are typically large, rounded or oblong ovals, and vary in color. The number of eggs laid depends on their size. Larger raptors lay fewer eggs than smaller raptors. It is believed that larger raptors live longer and need fewer eggs or young to sustain the viability of the species, while the opposite is true for smaller raptors.

There may be a two to three day lapse between laying each egg, and the adult may not begin incubation until all the eggs are laid (owls begin incubation immediately after the first egg is laid). The female does the incubating while the male provides food for her. The period of incubation varies with the size of a bird. For owls, hawks, and falcons there is usually a 26 to 35 day incubation period, while eagles and vultures will incubate from 36 to 50 days. Raptors in temperate climates breed in spring and summer.

After an eggshell is first cracked, it may take one to two days before hatching is complete. Raptor chicks grow quickly, doubling their birth weight in only a few days. The length of time a raptor spends from hatching until it is ready to fledge (fly on its own), depends on its size. Larger raptors stay in the nest from two to three months, while smaller raptors stay three to four weeks.

Scientific Classification of Raptors

There seems to be constant change in the taxonomy of birds based on new scientific information. The following classification is based on The Cambridge Encyclopedia of Ornithology and may not completely match the classification found in a specific field guide. The descriptions are general down to the Family level.

Class - Aves

Subclass - Neornithes

Order - Falconiformes - (Hawk-like birds)

Family - Sagittariidae

Family - Pandionidae

Family - Cathartidae

Family - Falconidae

Family - Accipitridae

Order - Strigiformes - (Owls)

Family - Tytonidae

Family - Strigidae

Class - Aves

1. The scientific class Aves includes all birds.
2. Birds have feathers, wings, beaks, and scales on their legs and feet. They're also warm-blooded, breathe air, and lay eggs.

Subclass - Neornithes

This subclass includes all species of modern birds.

Order - Falconiformes - Hawk-like birds

1. Falconiformes have the characteristic hooked beak with sharp edges; fleshy ceres (soft skin) at the base of the beaks; sharp, curved talons; keen vision; and are carnivorous (animal-eaters).
2. Falconiformes are commonly called birds of prey or raptors. They are called diurnal raptors because they hunt during the day. Owls (Order Strigiformes) are also birds of prey, but are nocturnal (hunt at night).

Family - There are five families in the Order Falconiformes.

Sagittariidae - There is only one species in this family, the secretary bird (*Sagittarius serpentarius*). Though classified as a Falconiformes, it has many crane-like physical qualities, such as long legs and short, blunt toes. The secretary bird lives in the savannas of sub-Saharan Africa.

Pandionidae - There is also only one species in this family, the osprey (*Pandion haliaetus*). This fish-eating species can be found near coasts, lakes and rivers worldwide. It has a unique foot structure. The outer front toe can swing to face backward with the hind toe, an adaptation for grasping their prey.

Cathartidae - New World vultures. There are 7 species in the family and they are found in open country and forests from southern Canada to southernmost South

America. Like Old World vultures, they're primarily carrion eaters and have more or less unfeathered heads. Unlike Old World vultures, they don't have a syrinx (voice box), don't build nests, and their septum (the structure that separates the two nostrils) is perforated. The Andean (*Vultur gryphus*) and California condors (*Gymnogyps californianus*), turkey vulture (*Cathartes aura*), and black vulture (*Coragyps atratus*) are in this family.

Falconidae - Falcons and caracaras. The family Falconidae contains 60 species and can be found worldwide except Antarctica. Falconidae are generally agile predators relying more on live prey than carrion. They are similar to birds in the family Accipitridae, but their beaks are notched, and they have proportionately longer wings. The peregrine falcon (*Falco peregrinus*), prairie falcon (*Falco mexicanus*), and American kestrel (*Falco sparverius*) are in this family.

Accipitridae - Hawks, eagles, kites, Old World vultures, harriers, and buzzards. The family Accipitridae contains 217 species. The members of this varied group are believed to be derived from a common kite-like ancestor. Most are active predators and build stick nests. Bald eagles (*Haliaeetus leucocephalus*), red-tailed hawks (*Buteo jamaicensis*), Cooper's hawks (*Accipiter cooperii*), and golden eagles (*Aquila chrysaetos*) are in this family.

Genus and species - The Order Falconiformes has 286 species worldwide. There are 31 species that are generally considered North American birds.

Order - Strigiformes - Owls

1. Strigiformes have the characteristic hooked beak with sharp edges; fleshy ceres (soft skin) at the base of the beaks; sharp, curved talons, with a reversible outer toe; keen vision; and are carnivorous (animal-eaters).
2. Strigiformes have forward facing eyes that are set in the sockets; a facial disc; and extremely flexible necks.
3. Strigiformes are commonly called birds of prey or raptors. They are called nocturnal raptors because they hunt at night. Hawk-like birds (Order Falconiformes) are also birds of prey, but are diurnal (hunt during the day).

Family - There are two families in the Order Strigiformes

Tytonidae - Barn Owls. The family Tytonidae contains 10 species. They can be found in all habitats except extreme northern areas. The common barn owl (*Tyto alba*) is the most prominent member of this family.

Strigidae - (Typical) Owls. The family Strigidae contains 124 species worldwide. They live in all types of habitats worldwide except Antarctica and some remote

islands. Great horned owls (*Bubo virginianus*), short-eared owls (*Asio flammeus*), western screech owls (*Otus kennicottii*), and northern saw-whet owls (*Aegolius acadicus*) are in this family.

Genus and species - Worldwide 134 species are in the Order Strigiformes. Nineteen of these species are considered North American owls.

The raptors that spend all or part of the year in Idaho include owls, vultures, and hawks (falcons, eagles, kites, buteos, accipiters, harriers, osprey). Below is a list of raptors found in Idaho.

Strigiformes - Nocturnal

Owls

- Barn owl
- Barred owl
- Burrowing owl
- Flammulated owl
- Great gray owl
- Great horned owl
- Long-eared owl
- Northern pygmy owl
- Northern saw-whet owl
- Short-eared owl
- Snowy owl*
- Western screech-owl

Note: *Uncommon or rarely seen in Idaho.

Falconiformes - Diurnal

Vultures

- Turkey vulture

Hawk-like birds

Falcons

- American kestrel
- Gyr Falcon*
- Merlin
- Peregrine falcon
- Prairie falcon

Eagles

- Bald eagle
- Golden eagle

Kites

- White-tailed kite*

Falconiformes - Diurnal

Buteos

- Broad winged hawk*
- Ferruginous hawk
- Red-tailed hawk
- Rough-legged hawk
- Swainson's hawk

Harriers

- Northern harrier

Accipiters

- Cooper's hawk
- Sharp-shinned hawk
- Northern goshawk

Osprey

- Osprey

Characteristics of the Different Raptor Families

Vultures

- Large black raptors with a long wingspan.
- Often seen soaring in groups in high, wide circles, with a rocking or teetering flight; glides in a strong "V" shape.
- There are three species of vultures in North America, the turkey vulture, black vulture, and the California condor; only the turkey vulture is found in Idaho.
- These raptors are known to gather by the hundreds or even thousands to roost together.
- Diet consists mostly of carrion which they locate from the air (by sight and smell).

- They are known as "honest" foragers, meaning they scavenge for their food, using a refined sense of smell.
- These raptors have bare, unfeathered heads, which reduces infection when feeding on rotten meat.
- Studies reveal that vultures will not find carrion on the day that it is killed, but almost always find it on the second or third day when it has begun to rot, and will rarely visit a kill on the fourth day when it is in a state of full-blown, foul smell. It is thought that on the first day the carrion is too fresh to give off enough odor to be easily located by vultures; but by the second or third days, enough decay has taken place to make the kill noticeably pungent; by the fourth day, there is no doubt of the kill giving off plenty of odor to be located by the bird, but very often the quality of meat is so severely compromised by the buildup of microbial toxins, that it is no longer attractive to vultures.
- With the ability to sustain life on half-rotten meats, they have extreme tolerance for microbial toxins (botulism) that greatly exceeds the capacities of many other birds.
- Fairly silent unless cornered, then it lets out a "hiss" or "low grunt."
- No nest; eggs are usually laid on the ground, in caves, hollow stumps, etc.
- Chicks are fed by regurgitation.
- These raptors use their sharp, hooked beaks for tearing meat; have weaker legs and feet and small hind toes since they are not used for capturing prey.

Owls

- Species vary in size, but typically have large, round heads, with forward-facing eyes framed by a feathered facial disk.
 - They have broad wings, short tails, lightweight bodies, and unusually soft, fluffy body feathers.
 - Typically nocturnal predators, relying on their excellent vision and hearing to catch food.
 - Some owls have tufts of feathers on top of their head, often called horns or ears, they are neither but are thought to serve as camouflage or behavioral signaling devices.
 - Have large asymmetrical ear cavities located behind the eyes on each side of the face, underneath the feathers.
 - The asymmetrical ear cavities allow owls to locate prey by triangulation of sound.
 - The round face and facial disks of feathers around the eyes also aid in hearing by funneling sound to the ears.
 - The eyes are fixed in their sockets so they are only able to see what is in front of them. To see the things around them, they must rotate the head.
 - They can rotate their heads 270° to the left or right but not in a complete circle. Owls have a total of 14 neck vertebra which allow this flexibility.
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- Have four toes; a permanent back toe and three front toes, one of which can rotate to the rear to improve their grip while capturing prey.
 - Most owls have feathers down to their talons unlike most non-owl birds of prey; thought to help in keeping warm and protection from prey bites.

- Owls have soft-edged flight feathers that allow them to fly silently; the flight feathers of an owl are slightly spaced to allow air when flying to move around and through them helping to keep noise down.
- Diet consists of rodents and small mammals; their digestive system makes use of the nutritious portions of the prey, and the undigested parts (hair, bones, claws, teeth, etc.) are regurgitated in the form of a pellet.

Hawks is a general term used to describe the entire group of diurnal raptors. Worldwide there are over 200 species of meat-eating birds that comprise the order Falconiformes, the scientific name for hawks. Some hawk species undertake long migration journeys, traveling thousands of miles each year - a testimony to their strength and stamina. They all have excellent hearing and eyesight. Their vision can be as high as eight times greater than that of humans. In Idaho, hawk-like birds typically breed in early spring. Many species will pair for life, but will take a new mate if the other dies. Some species pairs remain together year round, while others may separate after the breeding season and repair the next year.

Eagles

- Large bodied raptors, mostly dark brown in color with long, broad wings, and fan-shaped tails.
- Have large, strong feet and a powerful beak.
- Often spotted soaring high and gliding.
- Two species widespread throughout North America, the bald eagle and the golden eagle, can be found in Idaho.
- The bald eagle has been America's national symbol since 1782; the bald eagle is unique to North America.
- The average wingspan of an eagle can vary from six to seven feet.
- The adult bald eagle appears very different from immature eagles, it has a distinctive white head and white tail and a bright yellow beak. These distinguishing bald eagle features do not start to appear until after the fourth year molt and may take 7-10 years to achieve full adult plumage
- Bald eagles usually live near water (oceans, rivers, lakes), while golden eagles live in open, mountainous country.
- Eagles nests are very large, measuring up to six feet wide and weighing 100 pounds; many nests are used repeatedly year to year.
- Eagles may roost singly or in groups exceeding 100 birds.

Harriers

- There are 10 species of harriers worldwide; only one species in North America, the northern harrier.
- The Northern harrier is sometimes called a "marsh hawk."
- The Northern harrier is a medium-sized, slim raptor with long legs and tail.

- They live in open areas, often hunting in fields, meadows, or marshes.
- This raptor has a distinctive hunting flight called “coursing”, where they fly low over the ground following the contours of the land and holding the wings in a V-shape.
- It has a white rump patch at the base of the upper tail.
- Unlike other diurnal raptors, this bird has a facial disk which helps to direct sound to the ears.
- This raptor is a ground nester.
- Diet consists of rodents, small birds, and insects.
- Most species are reverse sexually dimorphic - meaning that the female is larger in size and brown and white in color, and the male is smaller in size and gray and white in color.

Osprey

- A large eagle-like raptor that lives and nests near fresh or salt water, on treetops or on the tops of man-made poles with platforms.
- They eat fish; and their fishing is made easy with their long legs and sharp talons.
- These raptors have long, narrow wings with a characteristic gull-like crook and dark patch at its wrist; their back is dark brown and their breast is white.
- They have a distinct dark eye stripe (malar stripe), and lack the protective bony ridge above the eye like other raptors.
- These raptors like to hover, and then dive into water for fish.

Accipiters

- Have short, broad, rounded wings and long tails, traits useful for speed and maneuvering in forested habitats.
- The diet of these small to medium-sized raptors consists mostly of other birds and small mammals.
- There are three species of accipiters found in North America, the northern goshawk, the Cooper’s hawk, and the sharp-shinned hawk; all can be observed in Idaho.
- Adult accipiters typically have dark gray backs, barred or streaked breasts and tails, red eyes, and long toes.
- Immatures typically have brown backs, streaked breasts, and yellow eyes.
- Their flight pattern includes rapid wing beats alternating with longer glides, and occasionally soaring.
- They are fierce, stealthy hunters.

Falcons

- A group of hawks that vary in size from small to medium, and are identified by their large head, notched beak, dark eyes, and distinct stripe(s) below their eyes called malar stripes.
- Their powerful short beaks have a tomial tooth on the upper jaw, which with the hooked tip create a notch for breaking the spinal cord of their prey.
- Powerful fliers and divers with long, narrow, pointed wings and long tails.

- These raptors do not build their own nests, but scrape out spots on cliffs or in cavities.
- They typically live in open country.
- Among the most aerial and acrobatic of the raptors, their flight ability is legendary; scientist say these raptors can fly at speeds of over 100 miles per hour.
- Five falcon species can be found in Idaho, they are the American kestrel, merlin, prairie falcon, peregrine falcon, and the gyrfalcon.
- It is this group of birds around which the sport of “falconry” revolves.

Buteos

- These are medium to large, stout bodied hawks, identified by their broad wings and fan shaped tails.
- These raptors are soaring hawks, but may also hover or fly low along areas where prey may hide
- Many species have a variety of color phases.
- Their diet consist primarily of small mammals, but as a group, they will capture a wide variety of prey.
- Often seen perched on large limbs of trees, utility poles, or fences.

Kites

- Medium-sized raptors which have falcon-like flight appearance, but distinctly different tails.
- These raptors have long, pointed wings and graceful flight.
- The toy kites that children love to fly are named after these birds’ ability to “hang motionless” in a steady wind.
- The hooked bill and snail kite have an exaggerated curve to their beak shape in order to eat snails.

Identifying Raptors

Although it takes time to be able to identify specific raptor species, you can tell which general group a bird belongs to by its size, silhouette in flight, and how it flies. The following groups are listed from largest to smallest.

Eagles are very large raptors with proportionally long, broad wings, a fan shaped tail that is twice as long as the head and neck. Eagles will soar on outstretched wings with few wing beats. They feed on small to medium sized mammals.



Buteos have broad, rounded wings, a robust body and a fan shaped tail. Buteos are medium to large soaring hawks. They may fly for long periods without flapping, riding on warm air currents. They feed on rodents, reptiles, and insects.



Accipiters are forest hawks that have short, rounded wings, and a long tail. These small to medium sized birds make rapid wing beats and then glide. They prey mainly on birds and small mammals.



Falcons have long, narrow, pointed wings, large heads, and long tails. They are small to medium size and have rapid wing beats in flight. They are famous for their technique of high speed dives toward their prey.



Legal Requirements for Possessing a Raptor or Raptor Parts

Many people ask “If I find an eagle or hawk feather, can I keep it?” Unfortunately the answer is No. All raptors are protected by state and federal regulations. It is illegal to capture or kill a raptor; possess a raptor (living or dead), or any pieces or parts of raptors, including feathers, without the proper permits from state governments and the federal U.S. Fish and Wildlife Service.

In the United States, wildlife species are considered the property of all citizens and are protected and managed by federal and state governments. Public sentiment, as well as the law, does not favor the unrestricted use of wildlife for commercial purposes. Thus killing, collecting, or taking into captivity most forms of wildlife is either against the law or strictly regulated.

Federal Permits

All birds native to North America, (which excludes pigeons, European starlings, and English sparrows), are protected by at least one, and sometimes many more, federal laws. Additionally, many states and municipalities also regulate the keeping of wild birds.

Laws Regulating Native North American Raptors

- **Migratory Bird Treaty Act - 1918** - This was one of the earliest laws passed to protect wildlife in the United States. This law was initially an international treaty between the U.S., Canada, and Mexico, and has now been amended to include Great Britain and Japan. The Act prohibits anyone from taking, killing, or keeping any native bird, its parts, or its nest, without a permit or license. **ALL** raptors native to the U.S. are covered by this law.
- **Bald Eagle Act - 1940** - Congress passed this act in response to the slaughter of eagles during the first half of the twentieth century, and because of the special status bald eagles hold as our national symbol. This law protects both bald eagles and golden eagles, their nests, and nest trees. It specifically prohibits anyone from killing or disturbing either species.
- **Endangered Species Act (ESA) - 1973** - This act provides additional protection for any animal listed as "threatened" or "endangered." As of January 2002, the raptors listed under the ESA include the bald eagle, spotted owl, California condor, peregrine falcon, and snail kite.

Each of these laws has a separate set of regulations and permits. Depending on the species of bird you would like to possess, at least one and possibly three federal permits may be required. For example:

- **S** to keep a red-tailed hawk a **Special Purpose Possession Permit** is required under the Migratory Bird Treaty Act,

- S** to keep a peregrine falcon, you must have a Special Purpose Possession Permit and an **Endangered Species Permit**,
- S** to keep a bald eagle, you will need a Special Purpose Possession Permit, an Endangered Species Permit, and an **Eagle Exhibition Permit**, issued under the Bald Eagle Act.

All of these federal permits are issued through the U.S. Fish and Wildlife Service and require annual reports and renewal.

Federal and state agencies and personnel are not exempt from obtaining permits. This includes state and national parks, wildlife areas, research facilities, all of which must obtain the same permits as everyone else.

Laws Regulating Non-native Raptors

- **Convention on International Trade in Endangered Species (CITES) - 1975** - Non-native raptors (those not regularly found in North America) are not protected under the previously mentioned laws. However, there are special regulations governing the import of non-native raptors. These raptors are listed under the CITES. The CITES requires special permits from the country of origin, as well as the U.S., before a raptor can be brought into this country.
- **Wild Bird Conservation Act (1954)** This law regulates the import of birds into the U.S.

Permits Required for Non-living Raptors

- **Special Purpose Salvage** If you would like to have a hawk feather or a mounted raptor you still must have a federal permit issued under one of the previously mentioned laws and possibly a state permit. The salvage permit allows one to possess non-living raptors or raptor parts. Dead specimens collected under this permit may be mounted, prepared as study skins, or otherwise used for educational purposes, including public display.