

Ornithology. Raptors: Discovering Raptors: From Field to Aviary

Faculty: Huson, Associate Professor of Animal Genetics, Animal Science

Faculty: Meghan Jensen, Ph.D., Raptor Researcher & Trainer, Cornell Raptor Program,
Department of Animal Science

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Schedule: Monday - Friday, 9-12 and 1:30-3:30, except Wednesday afternoon.

Location: Frank Morrison Hall, room 174 with some field work at Raptor Barn, Game Farm
Road



This glossary includes words you will find in your reading about a special group of birds called **raptors** or birds of prey. It will help you understand the words in bold that are found throughout our activity sheets and informational articles.

Animal – anything that is alive but not a plant. Birds, dogs, insects, turtles, fish and people are all animals.

Banding – placing a distinctive band or ring around a bird's leg to study and tell them apart from other birds.

Beak – the sharp mouth part on birds. The beak on a bird of prey or raptor is always curved to help the bird tear apart its food and swallow it in one piece. Another name for beak is a bill.

Carcass – the dead body of an animal.

Chick – a baby bird that hatches from an egg.

Eagle – a large and very powerful raptor that hunts during the day. Eagles will kill their own food but also will eat food that is already dead.

Falcon – a type of raptor that hunts during the day. Their wings are very long and pointed to help them fly fast. Falcons also have a hooked beak to tear apart their food and long toes to catch other birds or animals like bats.

Feathers – the outer body covering for all birds. Some feathers help to keep a bird warm; some feathers help a bird to fly, and some feathers help to hide a bird in their habitat.

Hawk – a type of raptor that hunts during the day. Hawks often have round-shaped wings and sometimes soar in the sky to find their food.

Nest – where birds lay their eggs. Some birds nest in trees, on rocks on mountains or in the grass. Some birds even nest underground.

Owl – a type of bird of prey that often hunts at night but can also hunt during the daytime. Owls have very large eyes, a round-shaped head and special feathers to fly quietly.

Predator – an animal which survives by killing and eating other animals.

Prey – a type of animal that is killed and eaten by another animal.

Raptor – a special bird of prey that has a sharp hooked beak and talons, and very good eyesight.

Talons – the claw or nail on a bird of prey or raptor. Talons are very sharp and are used to catch food. Only raptors have talons.

Vulture – a type of raptor that eat animals that have died in the wild. Vultures do not have powerful feet for killing their food but have a very sharp beak, good eyesight and a great sense of smell.



This glossary includes many of the words you will find in your reading about raptors, their ecology and behavior. It will help you understand the words that are found throughout our activity sheets and informational articles.

Adaptation — a physical characteristic or behavior that helps an animal or plant survive in its habitat. For example, a polar bear is colored white to live in the arctic and owls have unique feathers that allow them to fly silently to successfully catch their prey.

Bird of prey — a specialized bird which uses its talons to hunt other animals, has excellent eyesight and a curved and hooked beak. Examples of birds of prey are hawks, owls, eagles, falcons, osprey and vultures.

Brood — what an adult bird does to keep young chicks warm until the chick grows more feathers. Also, a group of chicks is called a “brood of chicks.”

Cache: (cash) – food that an animal catches and stores for later. Many falcons will cache their prey to eat later, sometimes up to several days.

DDT — a colorless, tasteless, and almost odorless insecticide. It was developed to prevent the spread of insect-spread diseases like malaria and typhus. DDT was banned in 1972 due to the impact on wildlife and humans. Peregrine falcons, osprey and bald eagles suffered declines in their numbers. The book “Silent Spring,” by Rachel Carson, teaches us about the impact of DDT on nature.

Diurnal — describes an animal that is active during the day, hunting and exploring its habitat. Diurnal is the opposite of **nocturnal**.

Down — the soft white fuzzy feathers on baby birds. Down is also the insulating feathers on birds.

Egg-tooth — a small bump on the beak of a raptor that helps the young chick to chisel and break the eggshell so the chick can hatch.

Endangered — an animal or plant is in danger of becoming extinct throughout all or most of its range.

Extinct — an animal or plant does not exist anymore. Once extinct, a species is gone forever.

Eyass or eyas: (EYE-us) — a young bird of prey that still lives in the nest and cannot fly. This is the same as a chick or nestling.

Eyrie: (EYE-ree) — the specific name for a raptor nest.

Fledgling — a young bird that is just beginning to learn to fly and no longer lives in the nest.

Floater — a bird without a breeding territory. A floater will often search for a breeding territory and may stay in or around other birds’ breeding territories before they return from migration or exploration.

Food chain — the network of how all things are connected on earth, based on one living thing eating another living thing in the habitat and so on. For example, the grasshopper eats grass, and a blue jay eats the grasshopper. A peregrine falcon then may come along and eat the blue jay.

Habitat — the natural home or environment of an animal or plant. A habitat needs to include water, food, shelter and space for an animal to survive. Examples of habitat are lakes, mountains, deserts, forests or grasslands.

Hacking — the “slow release” of a bird of prey from captivity to the wild. This is done when humans provide care to the bird until it can survive on its own in the wild.

Insecticide — a chemical used to kill insects.

Migration — the movement of an animal from one place to another. Some birds migrate from their traditional home territory to other places in the winter to find food and shelter, and then return in the spring to nest and raise their young.

Nestling — a young bird that still lives in the nest and cannot fly.

Nocturnal — describes an animal that is active during the night, hunting and exploring its habitat. Nocturnal is the opposite of **diurnal**.

Ornithologist — a biologist who studies birds and their behavior.

Peregrine Fund — the name of the raptor organization at Cornell University in New York that was created to save the peregrine falcon. Today, the Peregrine Fund works to save raptors all over the world and is located in Boise, Idaho.

Pip — to break through the outer hard eggshell. Raptors use their egg-tooth to help them pip or chisel their way out of the egg.

Predator — an animal which survives by killing and eating other animals.

Preen — what birds do to clean and straighten their feathers by using their beak.

Prey — an animal which is killed and eaten by other animals.

Range — a specific location on earth where an animal or plant lives. Examples of range are North America, the Arctic Circle, southeastern Asia or the Upper Midwest.

Raptor — a specialized bird which hunts other animals, has excellent eyesight, sharp talons, and a curved and hooked beak. The word raptor comes from the Latin word *rapere*, which means “to seize or grasp.” Examples of raptors are hawks, owls, eagles, falcons, osprey and vultures.

Scrape — a depression (shallow bowl) in the soil or crushed rock where falcons lay their eggs.

Species — a group of living things that can breed and have offspring. Scientists group living things together based on the way they look or act.

Territory — the area where an animal lives and travels during the day and night, and which is defended against other animals of the same species.

Threatened — an animal or plant is at risk of becoming endangered in the future, throughout all or most of its range.

Tiercel: (TEAR- cell) — the name used for a male raptor, especially a male peregrine falcon. In French it means “a third” since the male raptor is often a third smaller than the female raptor.



Falconry is a hunting sport in which humans use trained raptors to hunt game. Today, that tradition continues with more than 10,000 people practicing this sport of kings. Many falconry traditions that were used hundreds of years ago are still used today, like training the bird to wear a hood covering its eyes and using bells to find the bird after it leaves the fist. Explore the information below, which includes terms you will encounter in your reading about peregrine falcons and this ancient sport!

Anklets — The leather straps around the leg of the bird. Typically, the jesse goes through a grommet on the anklet. Anklets are also called bracelets.

Austringer — A falconer who hunts with short-winged hawks such as a goshawk, cooper's hawk or eagle.

Bal-Chatri — A wire cage with a live prey animal inside to attract a hawk to the trap. Nooses made from fishing line are attached to the outside of the cage to catch the bird by the foot or toe in a very safe way.

Bate — A bird's attempt to fly away from the fist or perch.

Bewit — Small pieces of leather which are used to attach the bell or telemetry to the bird's leg.

Bind — The bird grabs its quarry and holds onto it.

Bloom — The sheen of a bird's feather that indicates the bird is healthy and is properly cared for by the falconer.

Braces — The straps used to secure or open a hood. A falconer "strikes the braces" meaning they open the hood and remove it for the raptor to begin hunting.

Brancher — A bird which has left the nest but is not fully flighted. A brancher explores its world on the branches of the tree where the nest is located.

Cadge — A portable hawk perch that can have several birds perched on it at the same time, all which are typically wearing hoods.

Cast — A group of hawks or falcons flown together to catch quarry; to regurgitate undigested prey remains; to restrain a raptor for an exam or medical treatment.

Coping — To trim a raptor's beak, usually with a rotary grinding tool, file or nail trimmer.

Creance — A long leash or cord used when first training a raptor to fly towards the falconer without the bird being able to escape.

Crop — The small pouch of a bird where food is stored for a time, until the food travels to the stomach.

Deck feather — The center two feathers (rectrices) on a raptor's tail.

Dirt hawk — A falconer who uses a broad-winged hawk to catch quarry on the ground, such as a red-tailed hawk catching a rabbit.

Enter — To introduce a trained raptor on prey and have it successfully capture the quarry for the first time.

Eyass or eyas (EYE-us) — A young nestling raptor that is still living in the nest.

Eyrie or aerie (EYE-ree) — A raptor nest.

Falcon — A group of raptors with long, tapered wings, notched beak, malar stripe; refers to a female falcon.

Falconry — A hunting sport where a trained raptor catches game or quarry. The sport is over 4,000 years old.

Feak — When a raptor rubs its beak against something to clean the beak.

Foot — The action a raptor does to aggressively grab its quarry, perch or handler with the foot and talons.

Free loft — The type of housing where a raptor is permitted to freely fly to various perches or areas in the mews.

Fret marks — Lines or marks on the feathers of a bird, typically caused by disease, malnutrition, or stress, while the feather is molting.

Gauntlet — A leather glove used to hold a trained raptor.

Giant hood — A transport box used to carry a hawk or falcon from the mews to the hunting field or another location.

Haggard — A raptor that is over 1 year of age.

Hallux — The rear and generally largest, most powerful toe of a raptor. The hallux is often called the “killing toe.”

Hard-penned — When a feather has finished growing and the blood supply has receded in the feather shaft.

Hood — A leather piece of equipment used to cover the head of a raptor. Hooding a raptor often calms the bird by removing visual stimulus.

Imping — The process of replacing a broken or damaged feather with an undamaged feather of the same size and shape. Shaved wood pieces or carbon rods are used to insert into the new feather shaft, which is then glued into the shaft of the broken feather on the bird by matching the shape, length, and angle of the old feather.

Intermew — To allow a raptor to molt in captivity rather than releasing the bird into the wild. A bird that a falconer has kept in captivity through two molts is considered twice intermewed.

Jack — A male merlin.

Jerkin — A male gyrfalcon.

Jesse — The strap that passes through the grommet or opening on a raptor’s anklet so that the falconer can hold onto the bird. A swivel and leash are attached to the jesses, to help the falconer hold onto the bird or tie to a perch.

Leash — A piece of equipment attached to the jesses and used to tie the raptor to a perch or the falconer’s gauntlet.

Longwing — Refers to the group of raptors known as falcons, referring to their long, tapered feathers and wings.

Lure — A man-made object used to train a free-flying raptor to return to the falconer. The lure sometimes resembles a prey animal to encourage the bird to return. A small piece of meat is often attached to the lure, which is swung in the air.

Make in — The process of the falconer slowly approaching a raptor on a kill.

Man — To get a raptor accustomed to being trained and cared for by a falconer. A “well-manned” bird is one that is extremely comfortable around people.

Mantle — The behavior a bird does by spreading its wings over food in order to hide it from an intruder.

Mews — The name for raptor housing.

Micro-hawking — A type of hunting using smaller raptors, such as kestrels, sharp-shinned hawks or sparrowhawks.

Passage — A raptor that is younger than a year of age. A passage bird is captured on its first “passage” or migration.

Pitch — Refers to the height of a bird when in the air, before it goes into a stoop to kill its quarry or come to the lure.

Quarry — The prey that a falconer hunts with his/her raptor, such as rabbits, ducks or pheasants.

Rangle — Small, round stones or pebbles that the raptor eats to clean out its crop.

Rouse — A behavior a raptor does when it raises its feathers up and away from the body, almost doing a shake. A rouse is done when a bird is extremely comfortable in its surroundings.

Slice — The way a hawk or eagle defecates, often with some force. The feces “shoots” outward, often forming a straight line.

Snite — To sneeze.

Tiercel — Most often this refers to a male raptor, or specifically, a male peregrine falcon. The word means “a third,” referring to a male raptor being a third smaller in size than a female raptor.

Tiring — A tough piece of meat or bone that is often given to a raptor to occupy its time. It also aids in keeping the beak in proper shape and condition.

Waiting on — When a falcon circles high above the falconer and “waits on” until it goes into a dive or stoop after the flushed quarry.

Weathering — To perch a bird in the outdoors, where it can be exposed to sun, wind or light rain. A weathering yard is a protective pen where the raptor may be housed while experiencing time away from its mews.

Yarak — A Persian term that refers to a raptor which is solely focused on the hunt; strong and fit. The literal meaning is from “yârakî” — meaning strength, ability and boldness.

To learn more, visit history.mayoclinic.org

Recovery Timeline



The recovery of peregrine falcons is one of the most successful stories in the world, especially how it was accomplished in such a short time period. The timeline below shows how close the species came to extinction and how **Mayo Clinic** helped to change the direction away from extinction and toward recovery in the United States.

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| BEFORE 1940 | Approximately 350 pairs of peregrine falcons nested east of the Rocky Mountains, with 30 to 40 pairs found in the Upper Midwest. |
| 1940-1960 | Biologists and falconers discover that peregrine falcons are disappearing from the lower 48 states. |
| 1962 | Rachel Carson writes the book "Silent Spring," showing the impact that DDT is having on the environment. The last known successful peregrine nest is found in Minnesota at Whitewater State Park, producing a single female chick in 1962. |
| 1965 | Biologists from all over the world meet in Madison, WI, to discuss the decline of peregrine falcon populations worldwide and explore ways to prevent further decline. |
| 1973 | DDT is banned in the United States. In the U.S., the peregrine falcon is added to the Endangered Species list, along with bald eagles and gray wolves. On this date, there are fewer than 40 known nesting pairs of falcons in the lower 48 states. |
| 1970 | The Peregrine Fund is established to start a captive breeding program and to restore the peregrine falcon to its historic range. |
| 1982-1986 | The first releases of young peregrines in the Upper Midwest begin at Weaver Dunes along the Mississippi River. A total of 40 young falcons were released. |
| 1987 | The FIRST wild-produced peregrine hatches in the Midwest and survives! Mayo Clinic in Rochester, Minnesota becomes involved in the recovery program, releasing 21 captive-bred falcon chicks. |
| 1988 | Eleven additional captive-bred falcon chicks are released at Mayo Clinic. |
| 1991 | The first year that adult falcons occupy Mayo Clinic territory. Chase, a male falcon released in 1988 at Mayo Clinic, returns after recovering from an injury in St. Paul, MN. A female falcon, Minnsoar, soon joined him on territory but they did not nest. |
| 1992 | Mayo Clinic has its first successful nesting of peregrine falcons! Chase and Minnsoar care for three eggs, with one chick hatching on top of the Plummer Building. |
| 1995 | In the Upper Midwest, there are more than 65 nesting pairs of peregrine falcons and more than 110 young produced. Mayo Clinic has produced 11 young falcons. |
| 1999 | Peregrine falcons are removed from the Endangered Species List on August 20, 1999. Approximately 4,000 young falcons have been released since 1974; 1,300 falcons in the Upper Midwest. Mayo Clinic has produced 15 young falcons. |
| 2002 | Biologists decide to release two males and a single female, all rehabilitated at The Raptor Center in St. Paul, MN, from the top of the Mayo Building. |
| 2010 | In the Upper Midwest there are nearly 300 nesting pairs of peregrine falcons, which produced over 500 young. Mayo Clinic has produced 40 young falcons. |
| 2013 | The peregrine falcon is removed from Minnesota's Endangered and Threatened Species List. Mayo Clinic has produced 46 young falcons. |
| 2022 | Nationwide, there are over 7,000 nesting pairs of peregrines in the lower 48 states, and over 35,000 pairs in North America. In Minnesota, there are over 70 territories producing 120-150 falcons per year. Mayo Clinic has produced 66 young falcons since 1992. |

Peregrine Falcon Resources



Finding accurate and scientifically sound information on the internet can be difficult, especially when searching for popular animals like peregrine falcons. The Mayo Clinic Peregrine Falcon Program team recommends the following list of websites with information about peregrine falcons. This list includes information about the natural history, behavior, recovery efforts and issues surrounding peregrines which is crucial to anyone interested in learning more about this amazing species.

Midwest Peregrine Society: Formed to ensure the survival of Peregrine Falcons in the midwestern United States and Canadian Great Lakes region through scientific research, public education and field monitoring. Website includes an extensive database of over 10,000 banded peregrine falcons in the region.

midwestperegrine.umn.edu/?vw=home

The Cornell Lab: All about Birds: Dedicated to advancing the understanding and protection of the natural world, the Cornell Lab joins with people from all walks of life to make new scientific discoveries, share insights and galvanize conservation action.

allaboutbirds.org/guide/Peregrine_Falcon/id

The Peregrine Fund: The Peregrine Fund is responding to 21st century conservation challenges with a new strategic plan based on the conviction of its founders: “We will succeed by using science to inform decisions and by not accepting failure as an option.”

peregrinefund.org

National Audubon Society: Audubon protects birds and the places they need, today and tomorrow.

audubon.org/field-guide/bird/peregrine-falcon

Raptor Resource Project: Its mission is to preserve and strengthen raptor populations, expand participation in raptor preservation, and help foster the next generation of preservationists.

raptorresource.org/

Predatory Bird Research Group: Using the example of peregrine falcon recovery as an inspiration, scientists monitor the current status of predatory birds in California.

pbrg.pbsci.ucsc.edu/About.html

The Peregrine Falcon Recovery Project—Manitoba:

Working to re-establish a self-sustaining population of wild peregrines in the province.

species-at-risk.mb.ca/pefa/s-species.html

United States Fish and Wildlife Service: Working with others to conserve, protect and enhance fish, wildlife and plants and their habitats for the continuing benefit of the American people.

fws.gov/endangered/esa-library/pdf/Peregrinefactsheet.pdf

To learn more, visit history.mayoclinic.org