



2024 LEBANON COUNTY ENVIROTHON ELEMENTARY & MIDDLE SCHOOL

WILDLIFE OBJECTIVES

WOODLAND WILDLIFE

ESSENTIAL TOPICS

- I. Knowledge of Woodland Birds & Mammals
 - a. Woodland wildlife species identification
 - b. Natural history of woodland wildlife species
 - c. Habitat/ecosystem types and associated wildlife

- II. Understanding Wildlife Ecology
 - a. Survival requirements of woodland species and how they are met
 - b. Ecosystem dynamics:
 - Predator-prey relationships
 - Energy flow-food chain, food web, food pyramid
 - Succession (how a biological community evolves over time)
 - c. Adaptations

- III. Conservation and Management of Wildlife
 - a. Wildlife management
 - b. Improving/managing habitat for wildlife

- IV. Issues Involving Wildlife and Society
 - a. Endangered and threatened species
 - b. Habitat loss and fragmentation
 - c. Impact of declining habitat
 - d. Managing/planning for people and wildlife
 - e. Non-native species; invasive species; introduced species



LEARNING OBJECTIVES

1. Knowledge of Woodland Wildlife Species
 - a. Describe various roles of wildlife species in their ecosystems and be able to cite examples.
 - b. Identify species from mounted specimens, pelts, skulls, pictures, or silhouettes.
 - c. Describe ways habitat can be managed/improved for specific species.

2. Understanding Wildlife Ecology
 - a. Identify basic needs of wildlife species.
 - b. Identify, describe, and explain specific anatomical, physiological and/or behavioral species adaptations and how they help the animals survive (i.e. hibernation, defense posturing, venomous, etc.).
 - c. Describe predator-prey relationships, discuss physical adaptations of predator vs. prey species, and be able to cite examples.
 - d. Describe and be able to model food chains and food webs and be able to cite examples.
 - e. Describe factors that limit or enhance population growth.
 - f. Define and explain terms associated with wildlife biology and wildlife populations.

3. Conservation and Management of Wildlife
 - a. Describe the role of the PA Game Commission as the state agency responsible for the protection and management of wild birds and mammals and their habitats in Pennsylvania.
 - b. Describe ways each person can help in the protection, conservation management, and enhancement of wildlife populations.

4. Issues Involving Wildlife Species & Society
 - a. Describe what makes a species more prone to becoming endangered than other species.
 - b. Define and be familiar with the terms in the vocabulary list.
 - c. Distinguish between native, non-native, and invasive species. Explain the impact of non-natives on natives.
 - d. Describe the main causes that have led to depleted populations and describe measures being taken to help their recovery.
 - e. Describe major causes of habitat loss in Pennsylvania and how habitat loss affects wildlife.

WOODLAND WILDLIFE SPECIES - IDENTIFICATION STUDY LIST

| MAMMALS | | BIRDS | |
|-------------------|--------------------------|------------------------|--|
| Red Bat | Gray Fox | *Northern Saw-whet Owl | *American Goshawk |
| Bobcat | Northern Flying Squirrel | *Wild Turkey | *Black-capped Chickadee |
| American Marten | Fisher | *Tufted Titmouse | |
| Elk | Short-tailed Weasel | *Pileated Woodpecker | |
| Allegheny Woodrat | Porcupine | *Scarlet Tanager | <i>Note: When studying calls, the American Goshawk may be listed as its previous species name, Northern Goshawk.</i> |
| Snowshoe Hare | | *Barred Owl | |

***Must know calls - please refer to the PA Ethon app, Identifier, or links on the final page.**

2024 LEBANON COUNTY ENVIROTHON ELEMENTARY & MIDDLE SCHOOL



WILDLIFE VOCABULARY

1. **Accipiter:** Forest-inhabiting hawks with short broad wings, a long tail, and a characteristic flight pattern of several quick flaps and a glide (any hawk of the genus accipiter).
2. **Adaptation:** The process of adjusting to the environment. Examples include the opposable thumb of the opossum or the ability of the gray fox to climb trees.
3. **Arboreal:** Living in or often found in trees, of or relating to trees.
4. **Big Game:** Term for larger hunted species in Pennsylvania, including deer, elk, bear, and wild turkey. The enforcement of big game laws is an important part of the PA Game Commission's responsibilities.
5. **Biodiversity:** A term used to represent the variety of life forms in a given area.
6. **Browse:** To eat twigs and leaves from woody plants (method used by deer and elk to feed).
7. **Buff:** Pale orange-brown color of the undyed leather of several animals.
8. **Cache:** (*noun*) A place for hiding, storing, or preserving treasure or supplies. (*Verb*) To hide or store in a cache.
9. **Carnivore:** A meat eater.
10. **Carrion:** The flesh of dead animals.
11. **Cervid:** A mammal of the deer family (ceridae).
12. **Conservation:** The use of natural resources in a way that assures their continuing availability for future generations.
13. **Department of Environmental Protection (DEP):** State agency responsible for environmental laws regarding pollution, water, air quality, and drilling.
14. **Department of Conservation and Natural Resources (DCNR):** State agency responsible for the management of Pennsylvania's state parks and forests.
15. **Diurnal:** Active by daylight; opposite of nocturnal.
16. **Echolocation:** The process by which animals locate objects by emitting sounds and hearing them echoed. The electronic process of determining the distance and direction of unseen objects by reflected waves, as in radar and sonar.
17. **Endangered:** A species in danger of extinction throughout all or a large part of its range.

18. **Extinction:** The condition of having been removed from existence. An animal or plant facing extinction is one in danger of vanishing from our world.
19. **Extirpation:** The condition of having been removed from existence within a certain geographical location.
20. **Feral:** Referring to domesticated animals gone wild; e.g., feral cats.
21. **Food Chain:** The transfer of energy from the source in plants through a series of animals, with repeated eating and being eaten.
22. **Furbearers:** Legal designation for mammals which may be managed, trapped, and hunted only under regulations of the PA Game Commission. Include raccoons, foxes, coyotes, opossums, skunks, weasels, fishers, mink, muskrat, and bobcats.
23. **Game Animal:** Legal designation for animals which may be managed and hunted only under the regulations of the PA Game Commission. Small game in PA include pheasants, ruffed grouse, quail, cottontail rabbits, squirrels, and groundhogs.
24. **Habitat:** The arrangement of food, water, shelter, and space suitable to the needs of wildlife.
25. **Habitat fragmentation:** The partitioning of larger habitats into smaller more isolated parcels, usually as a result of development. This can negatively affect the abundance and diversity of plants and animals in an area.
26. **Herbivore:** A plant eater.
27. **Hibernation (hibernate):** To spend the winter sleeping or resting.
28. **Insectivore:** An insect eater.
29. **Invasive (species):** A plant or animal species that is not native to an area and causes or may cause harm.
30. **Litter:** A group of young animals that are born at a single time.
31. **Marsupial:** A type of animal that carries its babies in a pocket of skin on the mother's stomach. Examples include kangaroos and opossums.
32. **Migratory:** In wildlife, birds or other animals which make annual migrations; i.e., travel great distances in seasonal movements.
33. **Mustelid:** A mammal of the weasel family (Mustelidae), distinguished by having a long body, short legs, and musky scent glands under the tail.
34. **Native:** A plant or animal species that was produced, grown, or originated in a certain region.
35. **Nocturnal:** Active by night; opposite of diurnal.

36. **Nongame:** All wildlife species which are not commonly hunted, killed, or consumed by humans, such as songbirds and birds of prey.
37. **Non-native:** In conservation terms, an organism that has been introduced into a new area.
38. **Omnivore:** An animal that eats both plant and animal materials.
39. **Ornithology:** A branch of science that deals with the study of birds.
40. **Pennsylvania Fish and Boat Commission (PFBC):** The state agency responsible for the management and protection of fish, amphibians, and reptiles. Enforces boating and fishing regulations.
41. **Pennsylvania Game Commission (PGC):** The state agency responsible for the protection and management of wild birds and mammals. Enforces all hunting and trapping regulations.
42. **Plumage:** The feathers that cover the body of a bird.
43. **Pollution:** Harmful substances deposited in the air, water, or land, leading to a state of dirtiness, impurity, or unhealthiness.
44. **Predator:** An animal that kills and eats other animals (prey).
45. **Prey:** Animals that are killed and eaten by other animals (predators).
46. **Rabies:** A very serious and often fatal disease that affects mammals and can be passed to people if an infected animal bites them.
47. **Raptor:** A bird of prey.
48. **Reintroduction:** A wildlife management technique where a species is brought back into its historic range; replanting of animals in areas where they had become extinct. In Pennsylvania, the Game Commission has reintroduced bald eagles, osprey, elk, fishers, and river otters.
49. **Rodent:** A small animal (such as a mouse, rat, or squirrel) that has sharp front teeth.
50. **Scavenger:** An animal that feeds on carrion, dead plant material, or garbage.
51. **Species of Concern:** A species or vertebrate population for which there is concern or great uncertainty about its status. Species of Concern are not listed or protected under the Endangered Species Act. Instead, the goal of identifying a Species of Concern is to proactively address conservation needs and prevent the species from needing protection under the Endangered Species Act.
52. **Threatened:** A species present in its range, but in danger because of a decline in numbers.
53. **Venomous:** Capable of putting poison or venom into another animal's body usually by biting or stinging it.

Woodland Wildlife

Woodland Birds:

1. **Northern Saw-whet Owl:** With a body length of 8” and an 18” wing-span, the northern saw-whet is the smallest Pennsylvania owl. This owl species lacks ear tufts. The northern saw-whet’s call is a mellow, whistled note repeated often between 100 and 130 times a minute. The sound suggests the rasping made when sharpening a saw – hence the bird’s name. The northern saw-whet is *nocturnal* and seldom seen. By day, it roosts in young, dense hemlocks or thickets. They nest in deserted woodpecker and squirrel holes, hollow trees or stumps and nesting boxes. They feed on insects, mice, frogs, bats, voles, shrews, and small birds. Northern saw-whet owls are preyed upon by barred and great-horned owls.



2. **Wild Turkey:**

The wild turkey is easily recognized by its large size (36-49” tall) and familiar shape. Feeding on the ground, wild turkeys eat nuts, acorns, and seeds. They also eat grains, vegetation, insects, frogs, and lizards. They nest in natural or scraped depressions lined with leaves and grasses. Early, as the country grew, settlers cleared forests for farms. By the early 1900’s, when eastern forests had been cut, the turkey was in trouble. In the 1950’s, the state’s forests grew back and turkeys began to expand their range. Expansion was increased through the Game Commission’s wild turkey ‘trap and transfer’ program that later became a model for other states interested in restoring turkey populations. Wild turkeys are currently classified as *big game* animals in Pennsylvania.

3. **Tufted Titmouse:** This trim bird has gray-and-white plumage, a prominent head crest, and black “shoe button” eyes. This bird has expanded its range over the last fifty years; perhaps due to climate change and an increase in bird feeding by humans. Titmice eat insects, spiders, snails, seeds, nuts, and berries. Like the chickadee, the titmouse forages by hopping about in tree branches and often hangs upside down while inspecting the underside of a limb. To open a nut or seed, the bird holds the object with its feet and pounds with its bill. Winter flocks are often made up of parents and their young of the previous year. Titmice are early breeders, as males start giving their “peter, peter” territorial song in February.



4. **Pileated Woodpecker:** The largest American woodpecker (except for the rare, if not *extinct*, ivory-billed woodpecker). The pileated woodpecker has a solid black back and tail and a red crest for which it is named (from the Latin word for cap, *pilleus*). They do not migrate, but breed all over the eastern United States and Canada. Pileated woodpecker populations declined significantly with the cutting of Pennsylvania's original forest. By 1964, the population was recovering and they were considered fairly common in heavily forested areas. This bird eats large amounts of carpenter ants, also feeding on beetles, other insects, seeds, and fruit. Signs of pileated woodpeckers are chiseled-out, squarish, three to six-inch holes in trees.



5. **Scarlet Tanager:** Considered a neo-tropical migrant, scarlet tanagers favor dry, upland oak woods. Insects and fruits form the bulk of the diet. Males feature a bright red body with black wings. Females are a greenish yellow that blends with the leaves where they rest and feed. They *migrate* mainly throughout the Caribbean and spend most of the year east of the Andes Mountains in the remote forests of Columbia, Ecuador, Peru, and Bolivia. An analysis of their range and abundance has identified Pennsylvania as one of the most important states for the scarlet tanager. Pennsylvania's forests support 10% of the world's population of scarlet tanagers.



6. **Barred Owl:** The barred owl is a large bird of the deep woods. It features a rounded head, no ear tufts and is the largest owl in the state with dark eyes (the barn owl is the only other PA Owl with brown eyes, all others have yellow eyes). This owl is the most vocal of Pennsylvania's owls with the call described as "*Who cooks for you, who cooks for you all?*" It usually calls early in the night, at dawn, and occasionally on cloudy days. Barred owls normally nest in hollow trees or abandoned hawk nests. Pairs may show strong attachment to the same nest area, returning year after year. Barred owls feed on mice, amphibians, reptiles, rabbits, and insects. This owl ranges over the eastern United States, its distribution often coinciding with that of the red-shouldered hawk.



7. **American Goshawk:** The largest of Pennsylvania's *accipiters*, goshawks are swift, maneuverable, and relentless, sometimes pursuing prey (birds and small mammals) through thick cover on foot. Goshawks breed in wooded areas and prefer wild country, such as the mountains of Pennsylvania. They nest up to 75' above the ground in trees, building bulky nests (3 to 4' in diameter). A pair often uses the same nest year after year. These hawks defend their nests fiercely. Both immature and adult goshawks have a prominent white line over each eye; the eyes of adults are bright red. Protection of most hawks was established in 1937, but goshawks were particularly disliked and bounties were paid until 1951. The American Goshawk was previously known as the Northern Goshawk.

In 2023, the Northern Goshawk was split into two species: American Goshawk and Eurasian Goshawk. The goshawk is currently listed as *endangered* in PA.



8. **Black-capped Chickadee:** A black cap and bib, dull yellow to yellowish-brown flanks, and a white belly mark this small, spunky *songbird*. Most of a chickadee's diet consists of animal protein; moth and butterfly caterpillars, other insects, spiders, snails, and other invertebrates. In late summer and fall their diet changes to wild berries and seeds. In the fall chickadees begin storing food in bark crevices, curled leaves, clusters of pine needles, and knotholes. These songbirds rely on these stashes when other food becomes scarce. Chickadees will also eat suet from feeding stations and fat from dead animals. In winter, chickadees live in flocks of six to ten birds with one dominant pair. Chickadees mate for life and live, on average 1.5 to 2 years.



Woodland Mammals:



1. **Red Bat:** A common species found throughout Pennsylvania, the red bat (length 4.5") is easily identified by its rusty-red fur, tipped with white and long pointed wings. Females are duller, which is unusual, since both sexes in bats look alike. Red bats roost singly in trees often on forest edges and seem to prefer the American elm tree. Rarely do they use caves or buildings. Strong fliers, the red bat is considered *migratory*. They start south in September or October and fly at night. Red bats are *insectivores* and feed on moths, flies, beetles, crickets, cicadas, and other insects. Like other bats, they use *echolocation* to find their prey.

2. **Bobcat:** Also called the wildcat, the bobcat is a small, fearless *predator* that may attack animals many times its size. Pennsylvania's only feline predator, bobcats are equipped with sharp senses of sight, smell, and hearing. A mature bobcat averages 36" in length and weighs between 15 to 20 pounds, with large individuals as heavy as 35 pounds. Small animals such as mice, rats, shrews, squirrels, chipmunks, birds, rabbits, and hares make up the majority of this *carnivore's* diet. Bobcats occasionally prey on sick or weak deer but have little to no effect on deer herds. Bobcats were unprotected until 1970 when they were classified as furbearers. Populations have increased since then and the bobcat is currently under a highly conservative management program in Pennsylvania.



3. American Marten:

Also known as the pine marten, this species is closely related to the fisher, although smaller, measuring two feet in length. This *mustelid* hunts squirrels, rabbits, and birds. In a hollow tree nest, two to four young are born in spring; by fall they fend for themselves. With the cutting of Pennsylvania's original forest, this predator was considered *extirpated* within the state. Two specimens were collected in Pennsylvania in the twentieth century; one in Wayne County in 1963, and the second in Mercer County in 1970. Marten fur is prized, and some animals have been raised in captivity. The pine marten is considered relatively common in the Adirondack Mountains of New York state. The Pennsylvania Game Commission is developing a reintroduction and management plan to reintroduce martens to the state.



4. Elk: Before the arrival of settlers in Pennsylvania, elk lived throughout the state, mostly in the northcentral and Pocono Mountains. By 1867 the species had been *extirpated*; ultimately it became *extinct* throughout its range; which included New York and New England. The primary reasons were habitat loss due to over-logging and unregulated hunting. Today's elk descend from elk brought to the state and released by the Pennsylvania Game Commission between 1913 and 1926. Though they both belong to the *cervid* family, elk are much bigger and heavier than white-tailed deer. A mature male, called a bull, stands 50-60" at the shoulder and weighs 600 to 1000 pounds. Females, or cows, weigh 500 to 600 pounds. Elk may live up to 20 years in the wild. The current population is estimated at about 950 elk.



5. **Allegheny Woodrat:** This *herbivore* lives in remote, rocky *habitats*. The Allegheny woodrat measures 16 to 17" long, including a 7 to 8" fully furred tail, and weighs between 13 ounces to 1 pound. A *nocturnal rodent*, the woodrat feeds on fruit, nuts, berries, leaves, ferns, and fungi. As well as stockpiling food, woodrats collect treasures such as old mammal skulls, feathers, bottle caps, coins, rags, and leather straps. The Allegheny woodrat is listed as a *threatened* species and has been proposed for the federal endangered species act. Biologists believe several factors have caused this rat's decline including fewer oak trees in the state's forests, the loss of the American chestnut, the effect of gypsy moth on the oak forest, and the spread of a fatal parasite called raccoon roundworm.



6. **Porcupine:** The porcupine is a large (up to 30"), clumsy rodent with an appetite for tree bark and salt. The spines, especially on the back and tail, are loosely attached. They are barbed and can seriously injure an attacking animal. Spines are not quills, but modified hairs, and are not shot out by the porcupine. North America's second largest rodent (the beaver is larger), this *herbivore* feeds on twigs, needles, and small limbs of coniferous trees. They also feed on the inner-bark of trees such as hemlock, spruce, maple, beech, and others. Mammalogists believe the porcupine may have come from South America, crossed the Isthmus of Panama during the Pleistocene period, and spread throughout North America.



7. **Snowshoe Hare:** “Varying hare” and “snowshoe rabbit” are both names that describe the large hare of Pennsylvania’s north woods. The word “varying” refers to color changes that occur from summer to winter. This hare is one of two mammals within the state whose pelt changes color (the other is the weasel). “Snowshoe” refers to the wide furry paws, which provide good footing on snow and ice. The snowshoe is not a true rabbit; its young are born with eyes open and fully furred (precocial) in contrast to the hairless, blind cottontail young. Generally about 19” in length and weighing 3 to 5 pounds, the snowshoe hare can live up to 8 or 9 years. However, many don’t survive 2 years since foxes, coyotes, bobcats, weasels, and some raptors prey upon this *herbivore*.



8. **Gray Fox:** A small, agile *carnivore* belonging to the canine family, the gray fox measures 21 to 29” in length, sports an 11 to 16” tail, and weighs 7 to 13 pounds. This fox is commonly found in brushy areas, wetlands, and rugged, mountainous habitat. Foxes are affected by many limiting factors including trapping, hunting, car collisions, and coyote predation. A life span of 10 to 12 years is possible. The gray fox has a unique *adaptation*; unlike the red fox, the gray fox will climb trees. The gray fox is an opportunist and will eat what is easiest to find including mice, rats, rabbits, game birds, groundhogs, domestic cats, insects, squirrels, songbirds, bird eggs, and will also *scavenge*.



9. **Northern Flying Squirrel:** Northern flying squirrels are mainly *arboreal*, though finding food sometimes brings them to the forest floor. It's hard to spot a northern flying squirrel because they are nocturnal. They nest in hollow tree limbs, tree cavities, or large bird nests. Northern flying squirrels eat nuts, seeds, tree blossoms, fruits, berries, ferns, and fungi. They will store nuts in their nest or den or bury them in the ground. Predators include owls, feral house cats, foxes, coyotes, skunks, raccoons, and the black rat snake. The loss and fragmentation of old growth forests may be causing a decline in the population of the northern flying squirrel in Pennsylvania. Its current status in PA is *endangered* and it is listed as a priority species in PA's Wildlife Action Plan. Although they have flying in their name, northern flying squirrels do not truly fly. A furred fleshy membrane attached from the wrist of the foreleg to the ankles of the hind leg allows the squirrel to glide from tree to tree. Their back fur is silky grey mixed with cinnamon brown colors. Their belly is light grey and white. Large black eyes help them to see well at night.



10. **Fisher:** A *carnivorous* mammal, the fisher is swift and graceful as it climbs trees. The fisher is known as an *arboreal* mammal because it lives in trees and requires continuous forested areas to survive. Fishers choose cavities or holes in trees to make their home and live alone for the majority of the year. This allows them to be opportunistic *predators*. This means they select prey based on its abundance or ease in catching it. The diversity of prey includes rabbits, squirrels, porcupines, and rodents. Fishers are also known to *scavenge* for food and to consume fruits and nuts that may be available. However, fish are not a favorite food as its name suggests. Rarely would a fisher eat a fish. In fact, its name is thought to have originated with European settlers who felt it looked similar to a European skunk named 'fichet'. The fisher is a *furbearer*. Overharvesting for fur along with forest destruction caused a significant decline of its population to the point of *extirpation*. Today the Pennsylvania Game Commission is working to restore its habitat and has successfully reintroduced fisher to the state.



11. Short-tailed Weasel: The short-tailed weasel is also known as the ermine or Bonaparte's weasel (named for Napoleon Bonaparte who was shorter in stature). Small, at only 9-15 inches in length, its short tail sets it apart, along with soft fur, made up of underfur that is short and guard hairs that are longer. The short-tailed weasel molts similarly to the snowshoe hare. In spring, a dark brown hair coat grows in, while in autumn as daylight becomes shorter, the hair coat drops out and a white coat grows in for winter. They are alert, curious and bold. They make many different vocal sounds that include hisses, purrs, chatters, and screeches. When annoyed, they might stamp their feet to give off a musk odor. The short-tailed weasel can swim and climb trees to pursue prey. They have a loping gait that causes their back to arch as they move. In forests, they prey on mice, rats, cottontail rabbits, frogs, small snakes, birds, insects, and even earthworms. Though they are *predators*, they are preyed on by other predators such as fox, coyote, bobcats, and owls. The short-tailed weasel will den beneath stone walls, rock piles, fallen trees, or abandoned buildings. Their short legs have five small clawed toes on each foot. Strong senses of sight, smell, and hearing make their instincts keen. They are active, quick, and aggressive to hunt. They are mainly nocturnal hunters, however, based on food availability they may hunt during the day, too.



Helpful Links:

- <https://www.allaboutbirds.org/>
- <https://www.audubon.org/>
- <https://www.pgc.pa.gov/Wildlife/Pages/default.aspx>