

**2021 LEBANON COUNTY ENVIROTHON
ELEMENTARY & MIDDLE SCHOOL**

**WILDLIFE OBJECTIVES
WETLANDS**

ESSENTIAL TOPICS

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

- II. Understanding Wildlife Ecology
 - a. Survival requirements of wetland species and how they are met
 - b. Ecosystem dynamics:
 - Predator-prey relationships
 - Energy flow-food chain, food web, food pyramid
 - Succession
 - c. Adaptations
 - d. Wetland functions
 - e. Population dynamics

- 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 amount of wetlands
 - d. Managing/planning for people and wildlife
 - e. Non-native species; invasive species; introduced species



Helpful Links:

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

LEARNING OBJECTIVES

Envirothon Students will be able to:

1. Knowledge of Wetland Species
 - a. Answer questions concerning the natural history of wetland species if given natural history information.
 - b. Evaluate a specific wetland habitat and select or list species most likely to live there.
 - c. Describe various roles of wildlife species in their ecosystems and be able to cite examples.
 - d. Identify species from mounted specimens, pictures or silhouettes.
 - e. Describe ways habitat can be managed/improved for specific species.

2. Understanding Wetland Ecology
 - a. Identify basic needs required by wetland species.
 - b. Identify, describe, and explain specific anatomical, physiological and/or behavioral adaptations of species to the environment 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, 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 (i.e. carnivore, niche, herbivore, insectivore, omnivore, producer, primary consumer, secondary consumer, limiting factor, carrying capacity, territory, home range, population, and/or community).

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 habitat of Pennsylvania.
 - b. Describe ways each person can help in the protection, conservation management, and enhancement of wildlife populations.

4. Issues involving wetland wildlife species & society
 - a. Describe what makes one species more prone to becoming endangered than other species.
 - b. Define the terms reintroduction, endangered, threatened, extirpated, and extinct.
 - 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 the 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.

WETLAND WILDLIFE SPECIES - IDENTIFICATION STUDY LIST

MAMMALS		BIRDS	
Indiana Bat	River Otter	American Bittern*	Osprey*
Black Bear	Mink	American Woodcock*	Red-Winged Blackbird*
Beaver	Muskrat	Belted Kingfisher*	Wood Duck*
*Must know calls			
Please refer to the PA Ethon - "PA Bird Songs CD", download the PA Ethon app, and/or visit the 'Helpful Links' above.			

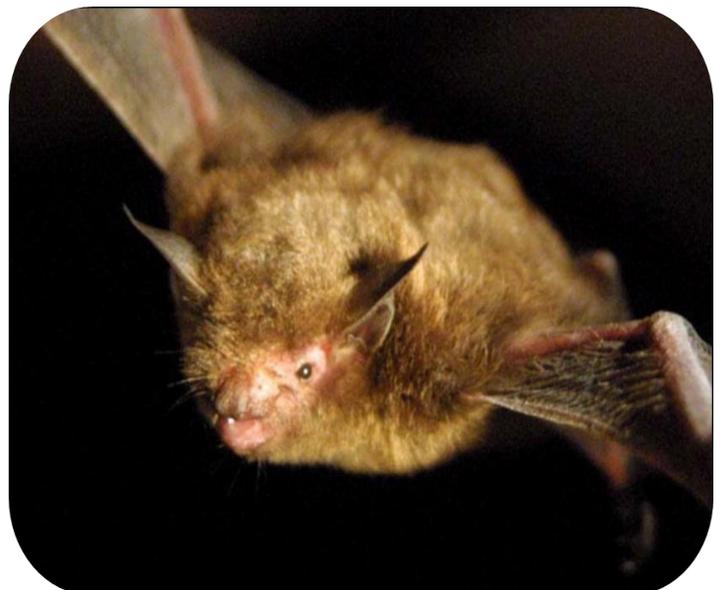


2021 LEBANON COUNTY ELEMENTARY & MIDDLE SCHOOL ENVIROTHON

WILDLIFE STUDY GUIDE WETLAND WILDLIFE

WETLAND MAMMALS:

1. **INDIANA BAT:** The Indiana bat resembles the little brown bat, but has a pinkish cast to its fur, giving it a light purple-brown coloration. Pennsylvania is on the edge of this species' range. The Indiana bat hibernates in clusters of about 250 bats per square foot on the ceilings and sidewalls of caves. Females bear a single young in late June. In Pennsylvania, the Indiana bat is listed as endangered and protected under the state Game and Wildlife Code. It also is a "priority species" in the state's Wildlife Action Plan. Nationally, it has been listed as an endangered species since March 1967. Their decline was caused by disturbance of their hibernacula (caves where bats hibernate) during winter months. Additionally, the arrival of White-Nosed Syndrome (WNS) in Pennsylvania in 2008. This fungus, though not dangerous to humans, has severely reduced cave bat populations within the state. WNS affects bats during hibernation, causing them to move around and therefore burn up their fat reserves prior to the arrival of spring. This insectivore's preferred habitat for hibernation has water nearby and in summer, females prefer areas along streams and rivers.



2. **BLACK BEAR:** Black bears are powerfully built animals with weights ranging from 140-400 pounds, with rare individuals exceeding 700 pounds. In Pennsylvania, most black bears are black with an occasional cinnamon phase. In other parts of their range they may be blonde or brown. These omnivores have an excellent sense of smell, average hearing, and poor eyesight. Bears walk in a flat-footed or plantigrade manner. Young are born in late winter and remain with their mother until the following fall. Their winter den may be: a hollow tree or log, a cave, a “nest” on top of the ground, or under a fallen tree or brush. In the northeast, which is prime bear habitat, bears prefer brushy swamps. Black bear numbers have been increasing from a statewide population of around 4,000 in the 1970’s to over 19,000 today. This has led to an increase in bear/human conflicts. To reduce these conflicts, the Game Commission has increased the length of bear seasons in certain areas and banned the feeding of bears.



3. **BEAVER:** The largest rodent found in the state, these herbivores feature a flat tail. The tail is adapted for use in swimming, as an alarm call, and to maintain balance when the beaver sits erectly. Their mouth and front paws are used in the construction of their dam and lodge. Beavers, amazingly, can stay underwater for up to 15 minutes! During a dive, the heart slows and valves close off the ears and nostrils. Beavers prefer streams and rivers narrow enough to dam, but can also be found in forested wetlands. This furbearer’s activity provides habitat for waterfowl, shorebirds, amphibians, and fish. Otters, raccoons, osprey, and other predators are attracted by this rich variety of wildlife and food. By the beginning of the twentieth century there were few beavers left in Pennsylvania. In 1917, the Game Commission released a pair of Wisconsin beavers. This successful reintroduction led to the reopening of beaver trapping in 1934, a tradition that continues today.



4. **MUSKRAT:** The nation's most abundant furbearer; this rodent lives on, or near, still or slow-moving water of ponds, marshes, streams, and rivers. Common in Pennsylvania, the muskrat feeds on the roots and stems of aquatic plants, especially the cattail. Like its cousin, the beaver, the muskrat constructs lodges of vegetation or may burrow into streambanks. Muskrats have a high reproductive rate, with an adult female having two, three, or even four litters per year. Commonly preyed upon by mink, their average lifespan is twelve months, but may live as long as five or six years. Through their feeding, muskrats can open up areas of densely vegetated marsh that can benefit waterfowl, macroinvertebrates, and other aquatic wildlife.



5. **RIVER OTTER:** An aquatic mammal not often seen, the river otter, like the weasel and mink, belongs to the mustelid family. Excellent swimmers with webbed feet, otters feed on fish, crayfish, frogs, snakes, muskrat, and other aquatic species. They make dens along streambanks or at the base of hollow trees. To improve wildlife diversity, the Game Commission reintroduced river otters beginning in 1983. Biologists released 110 river otters into six areas of the state. This furbearer has recovered to the point that a limited trapping season began in 2015. Wildlife Conservation Officers and other Game Commission personnel have observed otters, and signs of otters along the Susquehanna River, at Middle Creek Wildlife Management Area, and Swatara Creek in Lebanon County.



6. **MINK:** A common carnivore found near water, the mink is a member of the mustelid or weasel family. They prey upon muskrats, fish, and a variety of other mammals and birds. Like most mustelids, they are agile and fierce, killing prey with a hard bite to the back of the skull. On land, they travel with a slow, arch-backed walk or a bounding lope, which they can maintain for miles. They swim and dive well, using a webbing of stiff hairs between the toes of their hind feet. Generally nocturnal, the mink is active year-round. Mink den in abandoned groundhog tunnels, hollow logs, vacant muskrat houses (owners of which the mink may have eaten), and holes in stone piles, and beneath large tree roots. This furbearer survives best where water remains unpolluted, for this is where the greatest concentration and variety of prey is located.



WETLAND BIRDS:

7. **AMERICAN BITTERN:** A large wading bird measuring up to 34" tall with a 50" wingspan. They are regular breeding residents in scattered large wetlands. They feature a streaked, brown plumage and this bittern's unique call resembles "Pump-a-lunk". The American Bittern is listed as state-endangered, although not listed at the Federal level, and is a species of high concern in the Upper Mississippi Valley and the Great lakes region. In southeastern Pennsylvania, where many marshes were once used by breeding bitterns, today have been filled or reduced in size for development, or choked by sedimentation. Thus, demonstrating another example of the impacts of wetland loss and suburban/urban sprawl.



8. BELTED KINGFISHER: The kingfisher features a stocky body and a large head with a ragged looking double-pointed crest. The beak is sturdy and sharply pointed, the tail is short. The white neck-ring and breast stand out against the blue-gray body plumage. The female has a belt of rusty feathers along her sides and breast which the male lacks. People often hear the rattle-like call before seeing them. After catching a fish, the bird flies back to its perch, stuns the fish by whacking it against the perch, and swallows the fish headfirst. Pennsylvania is veined with streams, and kingfishers are widely distributed across the state. The birds are absent from places such as southern Clearfield County, where acid mine drainage has polluted long sections of waterways.



9. AMERICAN WOODCOCK:

The American Woodcock, or timberdoodle is a curiously well-camouflaged bird that inhabits hydric forests across eastern U.S. and Canada, but is categorized as a shorebird. Unlike their coastal relatives, these secretive birds live far from any beaches. During the night, they spend their time probing the soil with their long bills to feed on earthworms and other invertebrates, and can eat their weight in earthworms within 24 hours! Their nocturnal lifestyle, discreet plumage, and low-profile behavior make them difficult to find. However, at dawn or dusk in springtime, the males can be found showing off all night during a full moon. Classified as

a migratory gamebird and therefore under the jurisdiction of the U.S. fish and Wildlife Service, they feature a very long straight bill, large dark eyes, a large head, short neck, dark back, and buff brown breast. They have a distinct "Peennt" call. Woodcock may be exposed to pesticides used to control either forest and agricultural pests. Since these birds feed on earthworms, which are resistant to many chemicals, there's a possibility the woodcock can accumulate these persistent toxic chemicals found in worms.

- 10. OSPREY:** No longer listed as federally endangered or threatened, however, in Pennsylvania, this raptor is protected under the Game and Wildlife Code and the Migratory Bird Treaty Act of 1918. As recently as 1986, the state had only one nesting pair. Today, the number of nesting sites have climbed to 130 statewide. Ospreys are large, fish-eating birds of prey most often seen around water. They may exceed 24" in length and have a wing span approaching six feet. Also referred to as the "fish hawk", ospreys are dark brown above, bright white below, with some dark streaking on the breast. Key identification characteristics are the dark eye stripe, black patches at the crook of bent wings. Unlike bald eagles, they often hover while hunting. Habitat destruction, water pollution, and illegal shooting played a role in this bird's decline. Ospreys were also affected by pesticides, such as DDT, which affected their ability to lay healthy eggs and successfully reproduce.



11. RED-WINGED BLACKBIRD: The male is all black with a red shoulder patch bordered by yellow. The female is brown above and heavily streaked brown below; sharp-pointed bill; with a buffy-to-whitish eyebrow. Males hold territories of an eighth or quarter acre, which they defend by singing from perches with wings spread open and red shoulder patches exposed. Many ornithologists believe the red-winged blackbird is the most populous bird species in North America. Red-wings arrive at Middle Creek Wildlife Management Area in late February and early March. Adults usually breed within 30 miles of where they hatched. This songbird nests in loose colonies.



12. WOOD DUCK:



13. The wood duck is our most brilliant colored duck. This shy bird inhabits ponds and sluggish streams surrounded by woodlands. The drake's head is bright green, shading into blue and purple, with a slicked backed crest of feathers and a white "chinstrap." The wood duck has bright red eyes, a reddish-orange bill, and yellow legs. The hen's plumage is a drab combination of gray, white, and brown. The hen's key field mark is the white eye ring. In the early 1900's, the wood duck was nearing

extinction. Many woodland ponds had been drained and widespread logging had removed the mature trees needed for nesting. In addition, this duck was over hunted until 1913 when the U. S. Department of Agriculture banned hunting wood ducks for five years. That effort, followed by the ratification of the Migratory Bird Act between the United States and Canada, established framework for managing waterfowl. This protection and the construction and placement of wood duck nest boxes have led to the recovery of this beautiful duck. Today, only the mallard is a more common nesting duck found within Pennsylvania. Annually, approximately 250 wood ducks are banded by the Game Commission at Middle Creek Wildlife Management Area.



LEBANON COUNTY ENVIROTHON ELEMENTARY & MIDDLE SCHOOL

WILDLIFE VOCABULARY

1. **Accipiter:** medium-sized forest-inhabiting hawks that have 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. Two 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. This includes 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 such as bats 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:** an "endangered" species is one which is 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. **Extirpate:** to destroy or remove (something) completely.
20. **Feral:** referring to domesticated animals gone wild; e.g., feral cats.
21. **Food Chain:** the transfer of food 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. Furbearers 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. Fragmentation of habitat 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 has the ability to significantly displace desirable or native species.
30. **Litter:** a group of young animals that are born at a single time.
31. **Marsupial:** a type of animal (such as a kangaroo or an opossum) that carries its babies in a pocket of skin on the mother's stomach.
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; the 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/Ornithologist:** a branch of science that deals with the study of birds/someone who studies birds.
40. **Pennsylvania Fish and Boat Commission (PFBC):** the state agency responsible for the management and protection of fish, amphibians, and reptiles. Also enforces boating and fishing regulations.
41. **Pennsylvania Game Commission (PGC):** the state agency responsible for the protection and management of the 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, and 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 (such as dogs) and that can be passed on to people if an infected animal bites them.
47. **Raptor:** bird of prey
48. **Reintroduction:** a wildlife management technique where a species is reintroduced or brought back into 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. **Renewable Resource:** Living resources, such as plants and animals, which have the capacity to replace themselves when conditions for survival are favorable.
50. **Rodent:** a small animal (such as a mouse, rat, or squirrel) that has sharp front teeth.
51. **Scavenger:** an animal that feeds on carrion, dead plant material, or garbage.
52. **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, one of the goals of identifying a Species of Concern is to take proactive measures to address conservation needs and hopefully prevent the species from needing protection under the Endangered Species Act.
53. **Threatened:** in wildlife terms, a species present in its range, but in danger because of a decline in numbers.
54. **Venomous:** capable of putting poison or venom into another animal's body usually by biting or stinging it.