New Hampshire Wildlife Learning Objectives for the NCF-Envirothon

The following list of learning objectives comes from the National Conservation Foundation - Envirothon.

**** The 2026 New Hampshire Wildlife Section of the Envirothon Test will only focus on the learning objectives identified in the list below. Objectives that are blank will not be assessed during the New Hampshire wildlife test, but are still potential objectives for the International Competition. The full list can be found: https://envirothon.org/the-competition/ .***

Wildlife may be the first topic that comes to mind when you think of conservation: the panda, the elephant, the snow leopard, the grey wolf, the bald eagle, or any other well-known current or former endangered animal. These charismatic species are easy to rally behind, but the wildlife in your backyard or local park need the same basic resources as a rhinoceros: food, water, shelter, and space. Conservation for local wildlife is just as important as conservation for big-name species in exotic locales. Through understanding wildlife biology, ecology, and conservation, humans can reduce our negative impacts to wildlife and implement management strategies to help species thrive, both locally and globally.

Just like the ecosystems we study, human society and culture are incredibly diverse. In the same way that biodiversity makes ecosystems more resilient, these differences in human perspective and experience make us stronger as a global community. Every person's story and relationship with the environment is important, and we must work together to ensure that everyone's stories are heard, including the historically marginalized and economically disadvantaged. We invite you to seek out stories from your own communities – to discover the unsung conservation heroes, to learn the histories that aren't typically taught in classrooms, to highlight local environmental issues, and to explore what types of natural resource conservation are occurring in your local community, state/province, and nation.

Students should be able to:

- Provide an informed opinion about current issues in wildlife conservation.
- Think critically about solutions to current wildlife conservation issues.
- Work collaboratively in a team to synthesize and apply knowledge.
- Make connections between concepts in Wildlife and the subjects of Soils and Land Use, Forestry, Aquatic Ecology, and the Current Issue.

Wildlife Biology

1. Distinguish between major taxonomic classifications of wildlife, their typical roles in ecosystems, and their habitat requirements (including mammals, birds, fish, reptiles, amphibians, and insects).
2. Identify anatomy of various wildlife species and describe the functions of anatomical parts, particularly special adaptations.
3. *
4. Identify the different stages in a species' life cycle and describe how each stage relates to the species' biology, behavior, adaptations, habitat requirements, and ecological niche.
5. Provide examples of physical and behavioral adaptations (such as mimicry, camouflage, freeze response, hibernation, special organs, et cetera) and how these adaptations benefit wildlife.
6. Describe the significance of migration in the life cycle of certain wildlife species.
7. Explain how the needs of a species might change throughout its life cycle, and how these changing needs are addressed in management strategies.
8. *
9. Differentiate between a territory and a home range and discuss how each is important for wildlife species.
10. Explain the difference between generalist and specialist species and provide examples of each.

Wildlife Biology Study Resources:

- Nature Works from NHPBS: https://nhpbs.org/natureworks/
- NH Fish and Game - Wildlife Habitats: https://www.wildlife.nh.gov/wildlife-and-habitat/wildlife-habitat-program/habitat-types-and-species
- Audubon for Kids: https://www.audubon.org/get-outside/activities/audubon-for-kids
- National Geographic: https://education.nationalgeographic.org/resource/generalist-and-specialist-species/

Wildlife Ecology

11. Identify the essential components of a habitat and recommend suitable habitat for local wildlife species.
12. Identify biotic and abiotic factors in ecosystems and how they are related to wildlife habitat requirements, ecosystem variation, and wildlife conservation.
13. Describe the roles of producers, consumers, and decomposers in various ecosystems and identify their trophic levels.
14. Diagram a food web and describe the flow of energy within it.
15. Relate the energy pyramid to different trophic levels and the total amount of energy available to consumers.
16. Identify the effects of various environmental impacts on the energetic relationships in food chains and webs.
17. *
18. *
19. *
20. *
21. Describe how changes in demographic parameters (such as birth, mortality, reproduction rate, immigration, emigration, age structure, sex ratio, et cetera) affect wildlife populations.
22. Apply concepts of landscape ecology as they relate to wildlife conservation, including:
    a. Patterns in landscape and habitat type, and how this affects the distribution of wildlife species
    b. Use and proximity of different habitat types over the course of a species' life (migration, species that undergo metamorphosis, et cetera)
    c. Effects of disturbance on an ecosystem and its impacts to wildlife
    d. Habitat connectivity and the importance of wildlife corridors
    e. Genetic diversity in species across landscapes and the importance of this genetic diversity to healthy species populations
23. *
24. Define an ecological niche and describe how species fulfill these different roles in an ecosystem.
25. *
26. Describe different habitat characteristics that are important to wildlife (such as ecotones, edges, snags, downed logs, riparian areas, early successional stages, et cetera).
27. Explain the importance of the edge effect for species diversity and wildlife habitat.
28. *
29. Describe wildlife adaptations to unique ecosystems (such as high elevations, deserts, fire dependent ecosystems, et cetera).
30. Identify sources of disturbance in an ecosystem and predict how different types of disturbance may impact wildlife species.
31. Define resilience and describe what it means for ecosystems and wildlife species.

32. Identify the importance of major migratory flyways.
33. *

Wildlife Ecology Study Resources:

- NH Audubon *State of the Birds*: https://stateofthebirds.nhaudubon.org/
- NH Fish and Game - Habitat Management: https://www.wildlife.nh.gov/wildlife-and-habitat/wildlife-habitat-program
- Ecological Concepts and Wildlife Management Techniques (concentrate on pages 5-15, 43-45, and 118-141): https://www.nhenvirothon.org/_files/ugd/2c48e6_2e40a523ac0c4ca193dbd1bb4dd35fae.pdf
- NH Wildlife Action Plan: https://www.wildlife.nh.gov/wildlife-and-habitat/nh-wildlife-action-plan
- Landscape Ecology from Nature: https://www.nature.com/scitable/knowledge/library/principles-of-landscape-ecology-13260702/

Wildlife, Conservation, and Society

34. Identify major legislation (local and national) and international agreements pertaining to wildlife and describe how they provide protection for natural resources.
35. Explain the distinctions between species designations (such as common, rare, endangered, threatened, endemic, extirpated, and extinct) and provide examples of each type.
36. Recognize important issues facing wildlife on a local, state/provincial, national and international scale, propose solutions to current problems, and evaluate viability of solutions.
37. Define keystone, umbrella, game, non-game, and indicator species and describe their roles and functions within ecosystems.
38. *
39. *
40. Describe the role and history of hunting in wildlife management.
41. Identify positive and negative human-wildlife interactions and describe how these interactions are taken into consideration when creating management plans.
42. Define invasive and exotic species, describe their characteristics, name examples, describe how they are spread, and explain their impact on local ecosystems.
43. *
44. Explain the roles of local, state/provincial, national, and international agencies in wildlife protection and management.
45. Identify the costs and benefits of various wildlife management strategies (for example, a farmer sacrifices tillable acreage to maintain a wildlife buffer, losing potential crop revenue, but gaining better water quality for the farm, reducing erosion, and fostering habitat area for pollinators, quail, and other wildlife).
46. Explain the roles of local, state/provincial, national, and international agencies in prevention, control, and regulation of exotic and invasive species.
47. Describe the use of technology such as remote sensing, GPS, and GIS in wildlife management.
48. Describe the roles of key leaders in the conservation movement, both historical and present (such as Michael Werikhe, Rachel Carson, Dr. Drew Lanham, Aldo Leopold, John Muir, Christian Cooper, Corina Newsome, Jason Ward, Anna Botsford Comstock, et cetera).

Wildlife, Conservation, and Society Study Resources:

- North American Model of Wildlife Conservation: https://www.fws.gov/story/2022-04/north-american-model-wildlife-conservation-wildlife-everyone
- NH Endangered and Threatened Wildlife Species: https://www.wildlife.nh.gov/wildlife-and-habitat/nongame-and-endangered-species/endangered-and-threatened-wildlife-nh
- Conservation Heroes from USFWS: https://www.fws.gov/library/collections/conservation-heroes

Field Skills

49. Identify common local wildlife species from preserved specimens, skulls, skeletons, pelts, tracks, scat, and other animal signs without the use of a key.
50. Explain an animal's habitat, dietary requirements, and life cycle based on animal signs.
51. Identify wildlife based on communication methods (bird and frog calls, et cetera).
52. Use a field guide or dichotomous key to identify uncommon wildlife species.
53. Identify exotic and invasive species.
54. Assess a particular site for wildlife habitat and make recommendations for best management practices.
55. *
56. Apply sampling methods to measure wildlife populations and interpret data gathered from population studies.
57. Interpret population and demographic models.

Field Skills Study Resources:

- Refer to the list of wildlife species below to focus on for the New Hampshire test.
- NH Fish and Game: Borrow a Furbearer Fundamentals Kit (pelts, scat, tracks, skulls): https://www.wildlife.nh.gov/education/curriculum-resources/curriculum-kits
- NH Fish and Game: Wildlife Species Profiles: https://www.wildlife.nh.gov/wildlife-and-habitat/species-occurring-nh
- US Fish and Wildlife Service: Wildlife Species Profiles: https://www.fws.gov/species
- Cornell Lab of Ornithology (All About Birds): http://www.allaboutbirds.org/
- National Audubon Society (Birds): https://www.audubon.org/
- NH Fish and Game: Fish Species Profiles: https://www.wildlife.nh.gov/fishing-new-hampshire/fish-species-nh
- Calls of Frogs and Toads in the Northeast from Lang Elliott: https://musicofnature.com/calls-of-frogs-and-toads-of-the-northeast/
- NH Fish and Game - Habitat Management: https://www.wildlife.nh.gov/wildlife-and-habitat/wildlife-habitat-program

Wildlife Identification List:

Below are the lists of New Hampshire wildlife species students should know. Students should practice using a field guide or key to identify the following wildlife of New Hampshire from pictures, drawings, mounts, pelts, skulls, tracks, scat, and vocalizations. In addition, it is important to be familiar with their habitat requirements and natural histories. (*Note*: Students are not expected to know scientific names.)

Invertebrates:

American lobster, *Homarus americanus*
Black fly, *Prosimulium mixtum*
Brook floater mussel, *Alasmidonta varicosa*
Common house mosquito, *Culex pipiens*
Crayfish, *Cambaridae sp.*
Dwarf wedge mussel, *Alasmidonta heterodon*
Eastern elliptio, *Elliptio complanata*
Fairy shrimp, *Eubranchipus bundyi*
Monarch butterfly, *Danaus plexippus*
Viceroy butterfly, *Limenitis archippus*

Mammals:

Beaver, *Castor canadensis*
Deer mouse/white-footed mouse, *Peromyscus spp.*
Fisher, *Pekania pennanti*
Gray squirrel, *Sciurus carolinensis*
House mouse, *Mus musculus*
Muskrat, *Ondatra zibethicus*
Mink, *Neogale vison*
North American river otter, *Lontra canadensis*
Long-tailed weasel, *Neogale frenata*
Red squirrel, *Tamiasciurus hudsonicus*
Short-tailed weasel/ermine, *Mustela erminea*
Snowshoe hare, *Lepus americanus*
Woodland jumping mouse, *Zapus hudsonius*

Fish:

American brook lamprey, *Lethenteron appendix*
American eel, *Anguilla rostrata*
Bluegill, *Lepomis macrochirus*
Pumpkinseed, *Lepomis gibbosus*
Redbreast sunfish, *Lepomis auritus*
Sea lamprey, *Petromyzon marinus*

Birds:

American black duck, *Anas rubripes*
American crow, *Corvus brachyrhynchos*
Bald eagle, *Haliaeetus leucocephalus*
Barred owl, *Strix varia*
Broad-winged hawk, *Buteo platypterus*
Canada goose, *Branta canadensis*
Common loon, *Gavia immer*
Common raven, *Corvus corax*
Great blue heron, *Ardea herodias*
Great horned owl, *Bubo virginianus*
Mallard, *Anas platyrhynchos*
Northern harrier, *Circus hudsonius*
Osprey, *Pandion haliaetus*
Red-tailed hawk, *Buteo jamaicensis*
Turkey vulture, *Cathartes aura*

Reptiles and Amphibians:

American bull frog, *Lithobates catesbeianus*
Blanding's turtle, *Emydoidea blandingii*
Common garter snake, *Thamnophis sirtalis*
Eastern box turtle, *Terrapene carolina carolina*
Eastern milk snake, *Lampropeltis triangulum triangulum*
Green frog, *Lithobates clamitans*
Musk turtle, *Sternotherus odoratus*
Northern water snake, *Nerodia sipedon*
Painted turtle, *Chrysemys picta*
Snapping turtle, *Chelydra serpentina*
Spotted turtle, *Clemmys guttata*
Spring peeper, *Pseudacris crucifer*
Wood frog, *Lithobates sylvaticus*
Wood turtle, *Glyptemys insculpta*

Current Issue

Non-point Source Pollution: It begins at home!

Current Issue Study Resources:

- Basic Information about Non point Source Pollution from USEPA: https://www.epa.gov/nps/basic-information-about-nonpoint-source-nps-pollution
- Nonpoint Source Success Stories: New Hampshire: https://www.epa.gov/nps/nonpoint-source-success-stories-new-hampshire
- Ecological Concepts and Wildlife Management Techniques (concentrate on pages 5-15, 43-45, and 118-141): https://www.nhenvirothon.org/_files/ugd/2c48e6_2e40a523ac0c4ca193dbd1bb4dd35fae.pdf
- NH Wildlife Action Plan: https://www.wildlife.nh.gov/wildlife-and-habitat/nh-wildlife-action-plan
- Landscape Ecology from Nature: https://www.nature.com/scitable/knowledge/library/principles-of-landscape-ecology-13260702/