

Programs for Boy Scouts



Thank you for considering the Wetlands Institute in helping you receive your Merit Badge!

Listed below are the scout merit badges we can help you obtain. Each badge below is an overview of activities scouts participate in to fulfill the badge requirements. **Keep in mind, the staff at the Wetlands Institute does not have the resources and time to perform *all* activities which are required to receive badges. Please see the **asterisk* for the requirements that scouts must complete independently.**

What to bring and how to prepare

All activities involve some time outside, unless weather is severe.

Please be prepared for the weather!

1. Wearing old clothes is best and don't forget jackets, hats, etc. Sun block is highly recommended, and bug spray is optional.
2. Foot protection is essential, especially in the water where we will be walking on jagged shells and rocks. Most water shoes are not adequate protection and flip-flops do not stay on feet in the water or mud. Sports sandals (waterproof sandals with straps) work effectively. Old submersible sneakers work as well. Occasionally, shoes are lost in the marsh mud! Please do not send your child in expensive shoes.
3. If a troop is obtaining the badge on the grounds of the Institute, boys bring a bagged lunch. Programs are usually 2-3 hours long. If it is a long program, we'll provide the troop a half hour lunch break.

PLEASE NOTE: Ticks are an ongoing problem anywhere in New Jersey and can be found almost anywhere out-of-doors. We will make every effort to minimize this danger, however there can be no guarantee that a child will not pick up a tick. Checking for ticks should be an ongoing daily routine when children have been outside. Authorities believe that ticks need 24 hours to imbed before they can convey Lyme disease. Checking carefully each night can avoid this problem. Please let us know if you would like more information about ticks and tick-borne illness.

Non-badge educational programs are also available for Scouts. Check out our website at <http://wetlandsinstitute.org/education/field-trips/> for details.

Oceanography*



Join us as we explore the branches of Oceanography, practice measuring the properties of water, and take a closer look at live plankton! Part of the lesson takes place at the beach or the Institute's floating dock.

Requirements Performed at the Wetlands Institute

- Requirement 1. The group is introduced to oceanography and its branches. We discuss each branch and why it is important for each to be studied. Scouts describe at least five reasons why people should study oceans.
- Physical – temperature, salinity, wave formation, etc
 - Geological- ocean topography and tectonic plates
 - Meteorological – weather patterns, hurricanes, tropical storms
 - Chemical - ocean chemicals, hydrothermal vents
 - Biological - plants, animals, and other life forms and how they interact with their surrounding environment (ecology)
- Requirement 2. Walk down the trail to the Institute's dock or make a trip to the beach:
- Scouts will learn terms such as temperature, salinity, density, and perform demonstrations of each: Temperature test using thermometer in degrees Fahrenheit; Salinity test with a refractometer and hydrometer in units part per thousand; Density floating egg test along with other objects.
 - Discuss the circulation and currents of the ocean. Describe the effects of the oceans on weather and climate.
- Requirement 4. Scouts draw out a cross section of the ocean's topography and label the appropriate parts including:
- Continental shelf, continental slope, abyssal plain, seamount, guyot, rift valley, canyon, trench, and oceanic ridge.
 - Compare the depth in the ocean with the heights of mountains on land.
- Requirement 5. Completed during water testing at the Institute's dock or the beach:
- List the main salts, gases, and nutrients in seawater. Discuss some important properties of water.
 - Tell how the animals and plants of the ocean affect the chemical composition of seawater.
 - Explain how differences in evaporation and precipitations affect the salt content of the oceans.
- Requirement 6. Completed at the dock or beach during Plankton exploration.
- Describe some of the biologically important properties of seawater, defining benthos, nekton and plankton.
 - Name some of the plants and animals that make up each of these groups.
 - Discuss the ecological role of plankton in the ocean and how its important to the organisms in the ocean and on land
- Requirement 7. Plankton exploration at the dock or beach.
- Show plankton net. Off the dock, scouts take turns in trying to obtain a concentrated sample of plankton in salt water.
 - Scouts use our plankton microscopes to view and identify common plankton from their sample.
- Requirement 9. Conclusion discussion:
- We discuss what we've learned and the valuable resources that the ocean gives us such as food, water, oxygen, and so much more
 - We describe four methods that marine scientists use to investigate the oceans.

*Scouts are responsible for completing Requirements 3 and 8 independently.

Bird Study*



We practice using binoculars and field guides, head outside to observe the birds of the salt marsh, and build a bird feeder to take home. Part of the lesson takes place on the Institute's observation deck and wetlands trail.

Requirements Performed at the Wetlands Institute

We begin with a brief introduction to New Jersey Wetlands and what birds we might expect to see.

Requirement 1. The class will discuss the need for bird study and why birds are useful indicators of the quality of the environment.

Requirement 2. Using the Institute's collection of specimens and real bird feathers, we discuss avian anatomy and adaptations, labeling parts of the bird and bird wing.

Requirement 3. Explain how to properly use and care for a pair of binoculars.

Requirement 4. We distribute and practice using bird field guides and range maps for a variety of species, including those we may see in the salt marsh.

Requirement 5. Scouts will be given a tour down our marsh trail while practicing how to use binoculars and a bird field guide. Any birds observed in the field will be recorded in a field notebook, making a separate entry for each species. The following information is to be recorded from your field observations and other references:

- a. Note the date and time.
- b. Note the location and habitat.
- c. Describe the bird's main feeding habitat and list two types of food that the bird is likely to eat.
- d. Note whether the bird is a migrant or a summer, winter, or year-round resident of your area.

Requirement 6. The group will stop, listen, and identify a bird(s) by song or call alone. For each species, enter a description of the song or call. If you can see the bird, note its behavior. Why do you think that bird was making the call or song that you heard. We will discuss the function of bird songs.

Requirement 8. Scouts construct a bird feeder to take home. Scouts are encouraged to monitor their feeder to see what birds visit it.

*Scouts are responsible for completing Requirement 7 independently.

*Scouts will likely have to finish Requirements 5 and 6 with additional independent observations.

Environmental Science*



Join us as we explore the field of environmental science. We use our salt marsh habitat to delve into ecology, pollution, and endangered species, and compare species composition in two salt marsh areas.

***Pre-visit activity:** Make a time line of the history of environmental science in America and the contribution Boy Scouts have made. Time line does not need to be brought to the Wetlands Institute.

Requirements Performed at the Wetlands Institute

Requirement 2. What is involved in Environmental Science? Counselor and scouts will discuss the following terms: population, community, ecosystem, biosphere, symbiosis, niche, habitat, conservation, threatened species, endangered species, extinction, pollution prevention, brownfield, ozone, watershed, airshed, nonpoint source, hybrid vehicle, fuel cell.

Requirement 3. We explore a variety of environmental science issues and concepts:

- a. Ecology
 1. Discussion of what an ecosystem is, with particular focus on the salt marsh wetlands.
 2. Tell how it is maintained in nature and how it survives.
- b. Air Pollution
 1. Explain what is acid rain. In your explanation, tell how it affects plants, the environment, and the steps society can take to help reduce its effects.
- c. Water Pollution
 1. Perform water testing on the Institute's dock, discussing results and then emphasizing the importance of testing water for pollutants.
 2. Explain the importance of watersheds.
 3. Perform a bird feather/oil experiment to show the effects of an oil spill on waterfowl and methods to mediate affects. Discuss your results with your counselor.
- d. Land Pollution
 1. Conduct a test on salt marsh soil. Discuss the sponge-like qualities of the salt marsh and how it minimizes pollutants from land going into the ocean.
 2. What is soil erosion? Conduct an experiment to illustrate soil erosion by water, making drawings before and after the experiment. Show examples of soil erosion on the coast and why it's a big problem in New Jersey.
- e. Endangered Species
 1. Scouts receive a tour of our Wetlands Institute laboratory to see the work being done to help protect the Northern Diamondback Terrapin, horseshoe crabs, and shore birds.
- f. Pollution Prevention, Resource Recovery, and Conservation
 1. Discuss and record 10 ways you can reduce your waste/ carbon footprint to help the environment. Scouts try these techniques at home.

Requirement 4. Mark off two 4 square yard plots, one in the low salt marsh and one on higher ground, and count the number of species found in each. Estimate how much space is occupied by each plant species as well as the type and number of non-plant species you find. Write a report that adequately discusses the biodiversity and population density of these study areas. Discuss your report with your counselor.

*Scouts are responsible for completing Requirements 5 and 6 independently. Requirement 1 is completed through the pre-visit activity.

Fish and Wildlife Management*



Discover fish and wildlife management in NJ through the wildlife of the wetlands. We cover current threats to NJ species, management basics, and ways scouts can help wildlife, including making a bird feeder to take home. A wildlife walk and seine netting activity lets scouts see some of the species in our protected salt marsh. Part of this lesson takes place on the Institute's observation deck and wetlands trail.

Requirements Performed at the Wetlands Institute

We'll start with a brief introduction to the Institute and the wildlife we may encounter on our trail walk.

Requirement 1. Describe the meaning and purposes of fish and wildlife conservation and management.

Requirement 2. List and discuss at least three major problems that continue to threaten New Jersey fish and wildlife resources.

Requirement 3. Describe some practical ways in which everyone can help with the fish and wildlife conservation effort.

Requirement 4. List and describe five major fish and wildlife management practices used by managers in your state.

Requirement 5. Make a bird feeder:

- a. Scouts bring a used milk jug to make a bird feeder to take home. They then are encouraged to watch it each day and take note of the different species of birds that visit it.

Requirement 6. Head out for a Trail walk and visit to our observation tower:

- a. While visiting our observation tower and taking a trip along our trail walk, scouts must observe and record 25 species of wildlife. The list may include mammals, birds, reptiles, amphibians, and fish. Most wildlife seen at the Wetlands Institute includes birds and invertebrates.
- b. At the end of our trail walk, scouts will participate in seine netting. Seine nets allow us to catch fish, invertebrates, etc. This gives scouts an idea for what kinds of critters live in the waters of the salt marsh and how they play a vital role in the ecosystem.

*Scouts are responsible for completing Requirements 7 and 8 independently.

Nature*



Join us as we explore the relationships between plants and animals, construct a food web, and build a bird house to take home. We practice observing nature by looking for signs of the birds, reptiles, fish, and other animals of the marsh. Part of this lesson takes place on the Institute's observation deck and wetlands trail.

Requirements performed at the Wetlands Institute

We will begin with a brief introduction to the salt marsh wetlands ecosystem.

Requirements 1 and 2. We will discuss why plants are important to animals and vice versa. We focus on local plants and animals, which species are protected or endangered, and why.

Requirement 3. Scouts will understand the concept of a "food chain" as well as a "food web" with a game called "Cycles of Life" using both terrestrial and aquatic plants and animals.

Requirement 4. We will venture out for a marsh trail walk to our dock. On the way we will perform the following activities:

- a. Birds
 1. Using binoculars, identify eight species of birds on the trail and in our bird observation tower.
 2. Make a birdhouse to take home. Mount it outside and watch it for the next few months.
- b. Reptiles and Amphibians
 1. Even though you are extremely unlikely to encounter a snake in the marsh, we will show you how to recognize venomous snakes since there are some species in New Jersey.
 2. Look for diamondback terrapin nests and broken egg shells in the ground, and hopefully catch a glimpse of a terrapin itself!
- c. Fish
 1. Catch and identify two species of fish with seine or dip nets.
 2. Collect four kinds of animals eaten by fish in the wild using seine or dip nets.
- d. Mollusks and Crustaceans
 1. Identify five species of mollusks and crustaceans.
 2. Collect six shells to be discussed. Scouts can take **one** shell home; we will not mount the shells.
- e. Soils and Rocks
 1. Collect and identify soil layers found in a salt marsh using a soil corer.

*Scouts are responsible for completing the following portions of requirements independently:

1. Reptiles and Amphibians: identify three species of reptiles or amphibians in the field.
2. Soil and Rocks: Collect and identify five different types of rocks from your area.

NOTE: The Wetlands Institute has a permit to collect animals for educational purposes. We do encourage you to enjoy the outdoors while having minimal impact on the environment as possible. In other words, don't leave anything behind that isn't meant to be in nature and don't take away anything that *is* meant to be in nature.