

Nature Merit Badge



Session I

Scouting at Home
Bucktail Council BSA

Introducing Your Merit Badge Counselor

Dr. Harold “Hank” Webster

- **Scouting Background:** Cub Scout Den Leader, Webelos Leader, Cubmaster, Assistant Scoutmaster, Scoutmaster, Unit Commissioner, merit badge counselor, Polar Bear Chair, Camp Mountain Run staff, Silver Beaver
- **Education Background:** Biology Major @ Muhlenberg College, Master of Science in Botany @ Rutgers University, Ph. D. in Botany @ The University of Tennessee (plus lifetime learning about our natural world)
- **Work Experience:** Over 40 years of college teaching of biology, ecology, and botany. Currently Professor Emeritus, Penn State University. Former and current memberships in National Audubon Society, Pennsylvania Biological Survey, Pennsylvania State Water Plan, Clearfield County Conservation Districts, Pennsylvania Association of Conservation Districts, Pennsylvania Academy of Sciences, American Bryological and Lichenological Society, Building Up DuBois Sandy Garden Club, American Association of Retired Persons

Housekeeping Matters I

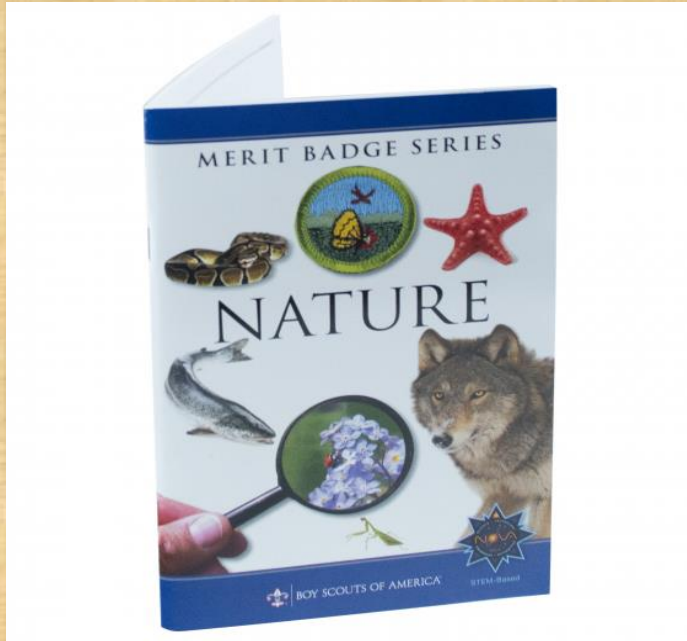
- **Blue cards:** Bucktail Council will assist in preparing blue merit badge cards in the same manner that is done for summer resident camp
- **Attendance:** Scouts are expected to participate in all online sessions. **ZOOM** will be our presentation platform
- **Workbook:** Scouts are urged to download the Nature Merit Badge Workbook and use it to record your work.
<http://usscouts.org/mb/worksheets/Nature.pdf>
 - You can then copy and submit your work to your counselor.
 - Scouts are expected to actually make their observations in nature and not just list information from reference sources.
 - A Scout is Trustworthy

Nature Merit Badge Notes

- In most cases all specimens should be returned to the wild at the location of original capture after the requirements have been met. Check with your merit badge counselor for those instances where the return of these specimens would not be appropriate.
- Under the Endangered Species Act of 1973, some plants and animals are or may be protected by federal law. The same ones and/or others may be protected by state law. Be sure that you do not collect protected species.
- Your state may require that you purchase and carry a license to collect certain species. Check with the wildlife and fish and game officials in your state regarding species regulations before you begin to collect.

Nature Merit Badge Pamphlet

- The Nature Merit Badge Pamphlet is recommended.
 - The pamphlet can be purchased through ScoutShop for \$4.99.
 - Nature Merit Badge Pamphlet SKU Item: 655195
 - Internet address:



<https://www.scoutshop.org/nature-merit-badge-pamphlet-655195.html>

Housekeeping Matters II

- **In Person Videoconferencing:** Participants need to follow BSA policies regarding Youth Protection. A minimum of 3 persons are to participate (your counselor, you and a third person, preferably a registered leader or parent/guardian)
- **Email and other communications:** Similar to videoconferencing (your counselor, you, and a third person copied on any electronic communications)
- **Covid-19: We will abide by federal, state, and local restrictions during the current coronavirus pandemic so Person-to-person sessions are unlikely.** Scouts will need to be resourceful to complete this badge but electronic communication makes it doable.

How Will Nature Merit Badge Be Offered?

- Three Videoconference Sessions (Zoom Meetings) Are Planned
 - Session 1: Introductions, Review of Requirements, Requirement #1, 2 & 3
 - Session 2: Guidance to Requirements #3 and 4
 - Session 3: Sharing of Progress and Resolving Questions (not yet scheduled)
- Submission of Assignments: As you complete each requirement, submit your work to your counselor at hw1@psu.edu
 - *Photos may be those taken with your own equipment or gathered from other sources. These can be submitted electronically with your work.
 - If you used outside resources to complete your requirements, then cite them
 - For example, you may seek internet sources to identify a specimen, tell me which ones you used. If you consulted another person then identify who they were and how they assisted.
 - Keep a log of your progress.

Some Ecology To Help Your Progress

- Our Earth's habitats are divided into Biomes
 - Pennsylvania is located in the Eastern Deciduous Biome
- Biomes have various communities
 - Some examples are freshwater wetlands, mature forests, and reclaimed mines
- Ecosystems are communities with associated environmental factors
 - Ecosystem approach is a better way to view where we live
 - Environmental factors include water, solar energy, wind, and soil
 - For this merit badge you will need to experience a variety of ecosystems
 - Each have characteristic plants and animals

Succession

- Succession is the series of stages that ecosystems experience over time until a stable, self-replicating mature system is attained.
- Two major types of succession are recognized
 - Primary: the establishment and development sequence where an ecosystem had not been previously
 - Typically long term, slow
 - Example: Newly established beach, volcanic eruption
 - Secondary: the reestablishment of ecosystem following a disturbance
 - Length of time dependent upon the severity of the disturbance
 - Climatic factors influence rates
- Terrestrial Example: abandonment of farming
- Aquatic Example: Conversion of a pond to a wetland forest



Requirement 1a: Name Three Ways In Which Plants Are Important to Animals

- Take notes for this Discussion

Requirement 1B: Name a plant that is protected in Pennsylvania or your region.

- In Pennsylvania, at risk plants are listed as rare, threatened or endangered. Federally at risk plants are regulated through the United States Environmental Protection Agency (USEPA).
- The Pennsylvania Department of Natural Resources (DCNR) is the responsible agency.
<https://www.dcnr.pa.gov/Conservation/WildPlants/RareThreatenedAndEndangeredPlants/Pages/default.aspx>
 - The [Wild Resource Conservation Act \(PDF\)](#) (WRCA) established a procedure for the conservation, classification, and protection of wild plants and charged the Department of Environmental Resources with that responsibility.
 - The Conservation and Natural Resources Act (Act 18) of 1995 split the Department of Environmental Resources into the Department of Environmental Protection and created the new Department of Conservation and Natural Resources.

Pennsylvania Wild Resources

- **Special Concern Population** -- A classification that is composed of colonies, groups or single individuals of a plant species that the department has determined to be a unique occurrence deserving protection. Among the factors that may be used to classify a plant population within this category are the existence of unusual geographic locations, unisexual populations or extraordinarily diverse plant populations.

Of the Approximate 3000 Plant Species in PA

Classification	Current Number of Species Listed under Chapter 45
Extirpated	102
Endangered	232
Threatened	78
Vulnerable	3
Rare	39
Tentatively Undetermined	128
Special Populations	0
TOTAL	582

What Makes a Pennsylvania Plant Rare?

- Habitat loss and fragmentation, due to development or conversion of habitat or natural succession
- Invasive plants displacing native plants
- Creation of more edge habitat, increasing the threat of invasive plant species
- Selective browsing by white-tailed deer or other wildlife may prevent plants from reproducing
- Over-collected by humans of showy, edible or medicinal plants
- Other????

Some Examples: White Milkweed (*Asclepias variegata* L.)



- Current Status: Pennsylvania Endangered
- As of 2014, only three extant records; these were found in Berks, Chester and Franklin Counties
- This species utilizes scrub-shrub thickets, an open habitat type that is often characterized by periodic disturbance, which includes fire, tree removal and conversion of old fields into scrub-shrub thickets. Reasons for this species' habitat declining in Pennsylvania include maturing forests and conversion of fallow agricultural land back into production or development.
- Reference:
http://www.docs.dcnr.pa.gov/cs/groups/public/documents/document/dcnr_20033071.pdf

Some Examples: Gray-Headed Prairie Coneflower (*Ratibida pinnata* (Vent.) Barnhart)



- Current Status: Pennsylvania Endangered
- Habitat for this species includes dry fields, limestone uplands and open roadsides
- In Pennsylvania, this species utilizes old fields, fallow farmlands, scrub-shrub fields, barrens and other open areas that have few mature trees
- In Pennsylvania, this species is currently only known to be found in Washington County
- http://www.docs.dcnr.pa.gov/cs/groups/public/documents/document/dcnr_20033071.pdf

Some Examples: Pumpkin Ash (*Fraxinus profunda* (Bush) Bush)

- Current Status: Pennsylvania Endangered
- The species' habitat of bottomlands and wet woods is also vulnerable to degradation and habitat conversion.
- In Pennsylvania, pumpkin ash is limited to the extreme northwestern portion of the state, in Erie, Crawford and Warren counties. There are twenty-one known populations of this species in the Commonwealth
- a significant threat to this and all ash species in Pennsylvania is the emerald ash borer, a non-native, invasive wood-boring beetle that was first identified in North America in 2002
- http://www.docs.dcnr.pa.gov/cs/groups/public/documents/document/dcnr_20033071.pdf



Requirement 2a: Name three ways in which animals are important to plants.

- Take Notes:



Requirement 2b: Name an animal that is protected in your state or region, and explain why it is at risk.

- The status of threatened and endangered birds and mammals in Pennsylvania is under the jurisdiction of the Pennsylvania Game Commission

<https://www.pgc.pa.gov/Wildlife/EndangeredandThreatened/Pages/default.aspx>

- Current Endangered Birds and Mammals
 - 18 Birds, 4 Bats, 1 Squirrel (Northern Flying Squirrel)
- Current Threatened Birds and Mammals
 - 4 Birds, Northern Woodrat, Small-footed Bat, West Virginia Water Shrew

Examples: [pink mucket](#) (*Lampsilis orbiculata*)

- This mussel recently discovered in the uppermost Ohio River after 75 years of absence
- occurs in isolated stream reaches in Pennsylvania
- Poor water quality and habitat conditions led to the decline of the pink mucket
- <https://www.fws.gov/endangered/map/pa-info.html>



Examples: Northern Flying Squirrel

- Two species of flying squirrels are found in Pennsylvania. The rare northern flying squirrel is limited to northern conifer forests
- (*Glaucomys sabrinus macrotis*) only 33 northern flying squirrels found between 2003-2007. Most known sites are in the Pocono region, with the exception of one in Warren County and one in Potter County.
- Loss of older conifer and mixed forest stands to development, especially in the Pocono Region, forest management practices geared towards wood products and early successional forest dwelling species, as well as the declining health of hemlock forest stands due to the hemlock woolly adelgid (an invasive insect).

Examples: Short-Eared Owl (*Asio flammeus*)

- at the southern edge of their North American breeding range
- found nesting on reclaimed strip mines in western Pennsylvania, in Clarion County south Allegheny County, and scattered reclaimed strip mines in the central part of the state
- In Pennsylvania, suitable nesting habitat for the short-eared owl is extremely limited and intensive agricultural practices make many potential habitats unsuitable.
- Future management, based on the needs for safe nesting habitat for all grassland nesters, should include the creation of large, herbaceous reserves
- <https://www.pgc.pa.gov/Wildlife/EndangeredandThreatened/Pages/Short-EaredOwl.aspx>



Requirement 2b: Name an animal that is protected in your state or region, and explain why it is at risk.

- Fish, amphibians, and reptiles are regulated by the Pennsylvania Fish and Boat Commission:
<https://www.fishandboat.com/Resource/SpeciesofSpecialConcern/Pages/EndangeredSpeciesandthePFBC.aspx>
- **Endangered** or threatened **species** cannot be caught, killed, possessed, imported to or exported from **Pennsylvania**. The Timber Rattlesnake and Eastern Copperhead are **protected** under additional regulations.
- Currently listed: 18 fish, five reptiles, four amphibians and two mussels.
- Another 28 fish and three reptiles that are candidates for endangered or threatened species listing

Examples: hickory shad (*Alosa mediocris*)

- an [anadromous fish species](#), meaning that it spawns in freshwater portions of rivers, but spends most of its life at sea
- Hydroelectric dams on the Susquehanna River has limited their return to breeding streams



Examples: Eastern Massasauga Rattlesnake

- The eastern massasauga is a natural part of our environment that has evolved over millennia.
- Scientific name: *Sistrurus catenatus catenatus*
- Habitat is consistently found in proximity to wetland areas which provide hibernacula habitat where the eastern massasauga overwinters for five to six months annually.
- In Pennsylvania, extant populations are currently known to exist at only four sites in Butler, Venango, and Mercer Counties
- Threats: agricultural practices, dam building, highway construction, mining, and succession of wet meadows to forests
- <https://www.fishandboat.com/Resource/Documents/species-plan-eastern-massasauga.pdf>



Resources from Nature Merit Badge Pamphlet

- **Scouting Literature**
- *Conservation Handbook; Fieldbook; The Principles of Leave No Trace;*
- *Mammals pocket guide; Reptiles and Amphibians pocket guide; Eastern Backyard Birds pocket guide; Western Backyard Birds pocket guide; Bugs and Slugs pocket guide;*
- *Edible Wild Plants pocket guide; Roadside Wildflowers pocket guide; Trees pocket guide;*
- *Freshwater Fishes pocket guide; Geology pocket guide;*
- merit badge pamphlets
 - *Animal Science, Backpacking, Bird Study, Camping, Canoeing, Environmental Science, Fish and Wildlife Management, Fishing, Fly-Fishing, Forestry, Gardening, Geology,*
 - *Hiking, Insect Study, Mammal Study, Oceanography, Photography, Plant Science,*
 - *Reptile and Amphibian Study, Soil and Water Conservation, Sustainability, and Wilderness Survival*

Resources from Nature Merit Badge Pamphlet

- **Books**

- Arnett, Ross H. *American Insects: A Handbook of the Insects of America North of Mexico*, 2nd ed. CRC Press, 2000.
- Behler, John. *Reptiles (The National Audubon Society First Field Guide)*. Scholastic Trade, 1999.
- Bland, Roger G., and H.E. Jaques. *How to Know the Insects*, 3rd ed. Waveland Press, 2010.
- Cassie, Brian. *Amphibians (The National Audubon Society First Field Guide)*. Scholastic Trade, 1999.
- Dance, S. Peter. *Shells*, 2nd ed. DK Adult, 2002.
- Dillon, Mike. *The Great Birdhouse Book*. Sterling Publications, 2000.
- Elpel, Thomas J. *Botany in a Day: The Patterns Method of Plant Identification*, 6th ed. Hops Press, 2013.
- Fichter, George S., and Phil Francis. *Fishing: A Guide to Fresh and Salt-Water Fishing*, St. Martin's Press, 2013.
- Griggs, Jack, ed. *All the Birds of North America: American Bird Conservancy's Field Guide*. Harper Collins, 2002.

Resources from Nature Merit Badge Pamphlet

- Additional Books:

- Harris, James G., and Melinda Woolf Harris. *Plant Identification Terminology: An Illustrated Glossary*, 2nd. ed. Spring Lake Publishers, 2001.
- Izaak Walton League of America. *Guide to Aquatic Insects and Crustaceans*. Stackpole Books, 2006.
- Levine, Lynn, and Martha Mitchell. *Mammal Tracks and Scat: Life-Size Tracking Guide*. Heartwood Press, 2008.
- MacDonald, David, ed. *The Encyclopedia of Mammals*. Facts on File, 2006.
- Rehder, Harald A. *National Audubon Society Field Guide to North American Seashells*. Knopf, 1981.
- Tarbuck, Edward J., et al. *Earth: An Introduction to Physical Geology*, 11th ed. Pearson, 2013.
- Wernert, Susan J., ed. *Reader's Digest North American Wildlife*. Reader's Digest, 2008.

Resources from Nature Merit Badge Pamphlet

- **Organizations, Periodicals, and Websites**

- **Acorn Naturalists** Website: <http://www.acornnaturalists.com>
- **American Birding Association** Toll-free telephone: 800-850-2473 Website: <http://aba.org>
- **American Museum of Natural History** Central Park West at 79th Street New York, NY 10024-5192 Website: <http://www.amnh.org>
- **Bee Culture Magazine** Website: <http://www.beeculture.com>
- **Discover Magazine** Website: <http://discovermagazine.com>
- **National Audubon Society** Website: <http://www.audubon.org>
- **National Fish and Wildlife Foundation** 1133 15th St. NW, Suite 1100 Washington, DC 20005 Website: <http://www.nfwf.org>
- **National Geographic Society** Website: <http://www.nationalgeographic.com>
- **National Park Service** Website: <http://www.nps.gov>
- **U.S. Fish and Wildlife Service** Website: <http://www.fws.gov>
- **World Wildlife Fund** Website: <http://worldwildlife.org>

Resources from Nature Merit Badge Pamphlet

- **Recordings of Bird Calls**

- Peterson, Roger Tory. *Field Guide to Bird Songs: Eastern/Central North America*. 1990. CD with 250 species.
- Walton, Richard, and Robert Lawson. *Birding by Ear*. 1989.
- Walton, Richard, and Robert Lawson. *Birding by Ear: Western*. 1990.
- Walton, Richard, and Robert Lawson. *More Birding by Ear: Eastern and Central*. 1994.

- **Biological Supply Companies**

- **BioQuip Products** Telephone: 310-667-8800
Website: <http://www.bioquip.com>
- **Carolina Biological Supply Company** Website: <http://www.carolina.com>

Summary

- The Nature Merit Badge will require several weeks to complete but can be rewarding as you learn more about the ecology of the Bucktail Council.
- If you are doing the Nature Merit Badge with other Scouts, each Scout is responsible for the requirements.
- Message me (hw1@psu.edu) if you have questions but remember the 2-Deep Youth Protection policy
- Session 2 will cover the remaining requirements and will be scheduled in the near future.
- Completed Blue Cards will be sent to your Scoutmaster upon completion of this merit badge.