

# NH ENVIROTHON 2016

## Forestry Section Study Information

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The forestry section of the ENVIROTHON will deal with the basic knowledge of forest types and facts that influence their diversity and use. Generally, your study should concentrate on the basics of how trees function and their importance to the forest ecosystem. You should focus on forest types, composition, identification and characteristics, tree biology including what is phloem and xylem, important insects and diseases of New Hampshire forests, and the different silvicultural systems to manage our NH forests (e.g., selection cutting including group selection; shelterwood, seed tree, and clearcutting) benefits of forest land and forest management practices. The forestry test will also include a few questions on the current year theme which this year is Invasive Plants and their impacts in forest settings.

The forestry section of the ENVIROTHON test will consist of a two part challenge. One part will be a written section consisting of short answer, multiple choice, and true and false questions on any tree or forest related topic. The publication “Good Forestry in the Granite State” is always a featured reference and a source for many of the Forestry test questions over the years. This year focus on Recommended Voluntary Forest Management Practices for New Hampshire”; with special reference to the following sections: Regeneration Methods; Forest Management in Riparian Areas. All of these publications are available on the New Hampshire Envirothon website: [NHEnvirothon Forestry Section](#). The Current Theme for the 2016 Envirothon Competition is Invasive Insects and Plants. For some relevant Invasive Plant internet resources, continue reading this article.

The second part of the challenge will be a hands-on field exercise, which will include tree identification, forest measurements and forestry management methods. Things to study for the exam include:

### Forestry Concepts

- “Best Management Practices” to maintain water quality during timber harvest practices – what are they (e.g., constructing water bars on forest roads to prevent soil erosion) - [http://extension.unh.edu/resources/resource/248/Best\\_Management\\_Practices\\_for\\_Forestry:\\_Protecting\\_New\\_Hampshire's\\_Water\\_Quality](http://extension.unh.edu/resources/resource/248/Best_Management_Practices_for_Forestry:_Protecting_New_Hampshire's_Water_Quality)
- “Regeneration Methods”; carefully designed regeneration practices help perpetuate desired tree species; know what is the best way to regenerate tree species in NH; (see section 2.3 in “Good Forestry in the Granite State”)
- Silviculture (e.g., know the definition of “silviculture” - the art and science of establishing and tending trees and forests; know and understand the four recognized silvicultural systems including clearcut, seed-tree, selection, and shelterwood); what is crop tree management and how does it differ from the four recognized systems; know why thinning is conducted; know what high-

grading and forest liquidation means; name some of the NH tree species favored by the recognized systems (e.g., aspen and birch favor openings created by clearcutting; sugar maple prefers the shade retained by selection cutting); name some tree species that grow in different soil habitats (e.g., poorly drained habitats, rocky habitat, sand or gravel, habitats enriched by high organic matter); what does “stocking” mean; what does “rotation” mean.

- Forest types (e.g., White Pine, Northern Hardwood, Spruce-Fir, Hemlock, Red Oak, and Aspen-Birch) – see section 2.1 in “Good Forestry in the Granite State”
- Forest succession – see section 2.2 in “Good Forestry in the Granite State”
- Forest stands (know what a stand is)
- Shade tolerance in tree species – what species grow best in shade, and which grow best in full sunlight
- Tree biology (how trees grow; know the function of phloem, cambium, xylem, and pith, and where they are located in a tree)
- Know that trees vary in growth rate by tree species (e.g., Shagbark Hickory grows slowly while White Ash grows rapidly), and also by site conditions such as soil texture, soil moisture, soil fertility, and others
- Tree and shrub identification
- Deciduous
- Coniferous
- Uneven-aged management – what is it?
- Even-aged management – what is it?
- Site – what does site mean
- Know that trees vary in site requirements by tree species (e.g., white ash grows best on the best soils and thus has high site requirements; in contrast, aspen grows well on poorer soils and thus has low site requirements)
- Know some soil characteristics (e.g., high moisture, hard pans) that limit tree growth
- Stand age and size class (e.g., seedling, sapling, pole, and sawlog)
- Know the following forest diseases and their effects on trees: Dutch elm disease, white pine blister rust, beech bark disease, butternut canker
- Know the following forest insect pests and their effects on trees: Emerald Ash Borer, Asian Long-horned Beetle, and Hemlock Woolly Adelgid
- Tree measurements -
  - DBH – what is it
  - board feet
  - merchantable height
  - basal area
  - Cord (dimensions of cord)
  - Instruments to measure trees

Tree species that the students will be asked to identify are trees that are native to New Hampshire (no Latin names required).

### **Internet Resources - Forestry**

1) Good Forestry in the Granite State

<http://extension.unh.edu/goodforestry/index.htm>

2) Northeastern Forest Regeneration Handbook

[http://www.na.fs.fed.us/stewardship/pubs/forest\\_regn\\_hndbk06](http://www.na.fs.fed.us/stewardship/pubs/forest_regn_hndbk06)

3) Why Trees Grow Where They Do in New Hampshire Forests, USDA Forest Service, Northeastern Forest Experiment Station. NE-INF-37-39. By William B. Leak and Jane R. Riddle.

<http://www.na.fs.fed.us/stewardship/pubs/whytrees.htm>

4) Crop Tree Management. Quick Reference. USDA Forest Service. State & Private Forestry.

([http://www.na.fs.fed.us/stewardship/pubs/ctm\\_quick\\_ref.pdf](http://www.na.fs.fed.us/stewardship/pubs/ctm_quick_ref.pdf))

5) Asian Longhorned Beetle. – Background information on infestations.

<http://www.uvm.edu/albeetle/infestation/index.html>

6) Emerald Ash Borer Fact Sheet –

[http://www.emeraldashborer.info/cdfiles/informationeducation/what\\_is\\_eabfactsheetOH.pdf](http://www.emeraldashborer.info/cdfiles/informationeducation/what_is_eabfactsheetOH.pdf)

7) Hemlock Woolly Adelgid. Background information on this defoliator.

<http://www.srs.fs.usda.gov/cc/emerging/hwa.htm>

8) Beech Bark Disease. Background information.

Houston, D.R. and J. T. O'Brien. 2007. Beech Bark Disease. Forest Insect & Disease Leaflet 75. U.S. Department of Agriculture, Forest Service.

<http://www.na.fs.fed.us/spfo/pubs/fidls/beechnbark/fidl-beech.htm>

### **Invasive Plant Internet Resources**

- 1) Managing Invasive Plants Methods of Control -  
[http://extension.unh.edu/resources/files/Resource000988\\_Rep1135.pdf](http://extension.unh.edu/resources/files/Resource000988_Rep1135.pdf)
- 2) Herbicides and Forest Vegetation Management – Controlling Unwanted Trees, Brush, and Other Competing Forest Vegetation -  
<http://www2.dnr.cornell.edu/ext/info/pubs/VegetationMgmt/PA%20herbicides&forestvegetationmgmt.pdf> (pages 6-10).
- 3) Control of Nonnative Invasive Plants on Your Woodlot -  
[http://www.na.fs.fed.us/stewardship/pubs/invasive\\_ctrl/invasive\\_ctrl.htm](http://www.na.fs.fed.us/stewardship/pubs/invasive_ctrl/invasive_ctrl.htm)
- 7) State of New England Plants - [http://www.newenglandwild.org/conservation/state-of-the-plants-brief\\_rev2.pdf](http://www.newenglandwild.org/conservation/state-of-the-plants-brief_rev2.pdf)