

**NCF-Envirothon
Sample Forestry Test Questions**

1. (6 pts) Identify the trees labeled with the orange flags by common name:

A: Red Maple

B: Northern Red Oak

C: Sweetgum

D: Mockernut Hickory

E: American Hornbeam

F: Silktree Mimosa

2. (6 pts) Using the Biltmore stick provided, determine the merchantable board volume for the tree marked #2.

Diameter is: 14 inches

Merchantable height is: 1 log

Volume is: 80 bd ft

3. (4 pts) Determine the basal area of this plot using the 10 factor or metric 2 factor wedge prism. The plot center is marked with flag #3.

120 sq. feet per acre, 12 m²/ha

4. (4 pts) Based on your observations, describe the past history of land use on this wooded site.

Historically overgrazed and significantly affected by human settlement.

5. (2 pts) Explain 2 uses for a Geographic Information System (GIS) system in forestry.

Mapping and analyzing geographic (spatial) information, locating endangered species habitat, forest cover typing, locating ecologically sensitive land types, ownership boundaries, transportation or facilities siting, capability analysis (including insect/disease potential, watershed condition, erosion potential)

(One point for each correct answer, total of two points)

6. (3 pts) Ecosystem *composition*, *structure* and *process* (*function*) are the 3 components used to define ecological sustainability. For a ponderosa pine forest, list 1 issue or potential threat to sustainability for each of these three elements.

Composition - invasive species, increase in shade tolerant firs

Structure - increased stand density, more small trees, harvest focused on large trees

Process - fire suppression, increased high intensity fires-fewer low intensity fires

(One point for each correct answer in each appropriate category, total of six points)

7. (6 pts) Looking around, you will see that there is a thick, invasive non-native understory which is considered to be bad for the long-term health of the forest. Identify three negative impacts to the forest system of this invasive understory.

- **Shade out native vegetation trying to establish**
- **Inhibits travel lanes for wildlife**
- **Significantly inhibits the growth of desirable species for future harvest**
- **Could attract insect and disease problems**
- **No native species for insect/wildlife habitat**

(Two points for each correct impact, total of six points)

8. (4 pts) Plant productivity is often associated with the soil characteristics found on the site. Explain how tree growth can vary on an area that encompasses one soil map unit when aspect changes.

North facing aspects receive less direct sunlight. Therefore, soil temperatures are generally cooler and more moisture is available. South facing slopes tend to be droughty or drier, as they receive direct sunlight, which increases soil temperatures and soils dry out more quickly. This affects productivity, species composition, fire effects, soil conditions, etc.

(One point for North and South slopes receiving different amounts of sunlight, one point for how this affects temperature, one point for how this effects moisture, one point for overall impact on tree growth)

9. (3 pts) Urban/community foresters sometimes require knowledge about topics or disciplines that traditional forestry education does not include. What are 3 areas of information that you might need additional education in after receiving a forestry degree in order to be a good a urban/community forester?

Urban forestry is a specialized branch of forestry which is multi-managerial in nature involving forests, watersheds, wildlife, outdoor recreation, landscape esthetics, individual tree care, waste recycling, and wood production. It encompasses many disciplines other than traditional forestry, including arboriculture, horticulture, plant pathology, landscape architecture, entomology, community planning and development, and political science.

10. (8 pts) Using the provided invasive species samples, complete the following chart:

	Specimen A	Specimen B
Species		
Describe 2 Impacts on Local Area		
Introduction Vector		

Specimen A – Garlic Mustard: Crowds out native plants, Changes soil chemistry; Imported as decorative garden plant

Specimen B – Emerald ash borer: Attacks native ashes which have no defense, Lack of predators allows population to explode, Will eventually kill all ashes in a contaminated area; Accidentally introduced through trade

(1 point per correct identification, 2 points for impact, and 1 for introduction vector)

11. (2 pts) What effect did the re-routing of the stream here have on the surrounding trees – currently and for future trees?

The root systems of current trees were most likely damaged and water-logged, and some species are not adapted to constant water. All future trees will need to be water-loving species.

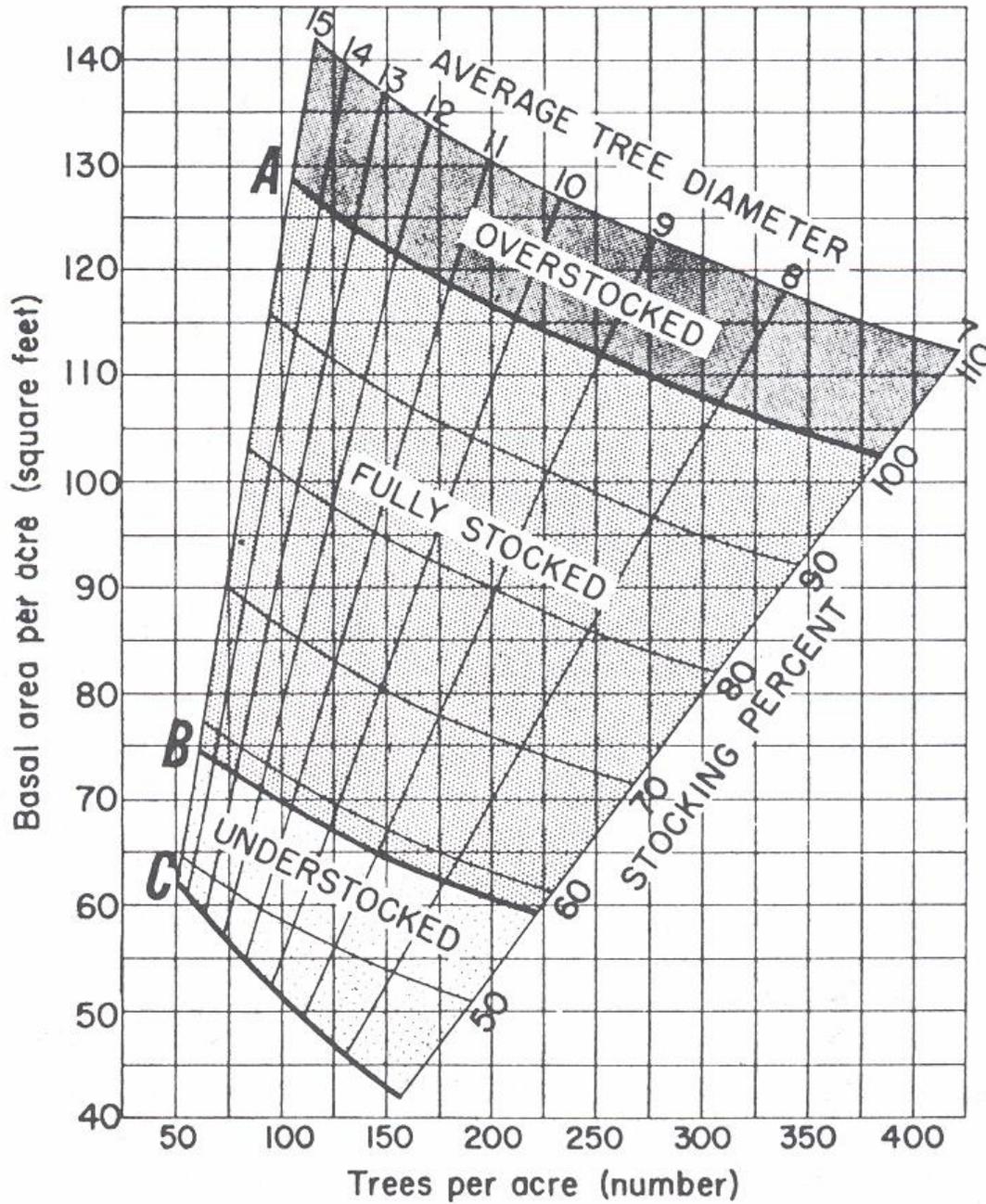
(One point for impact on current trees, one point for impact on future trees)

12. (3 pts) List three (3) reasons for using prescribed fire as a forest management tool:

- **Preventing the buildup of ground fuels/prevent high intensity wildfire kill weakened, diseased, or undesirable trees**
- **Stimulate regeneration in the forest**
- **Maintain a fire dependent ecosystem**
- **Create openings for wildlife habitat**
- **Fire is also used to fight wildfires (backfires)**

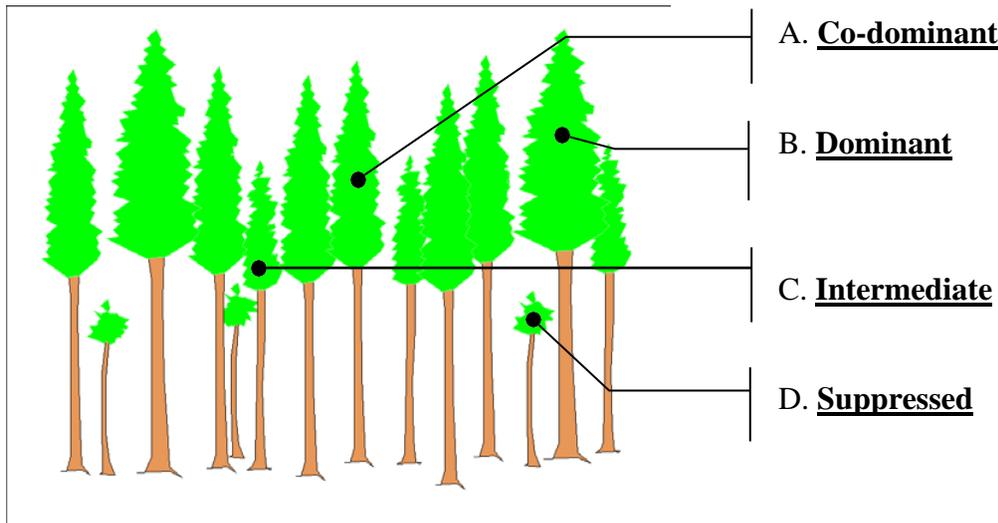
13. (4 pts) A stand of trees has a basal area of 95 square feet per acre and 300 trees per acre. Plot this information on the attached stocking chart and determine the stocking of the stand, which is:

- a. Understocked at 55 percent
- b. Fully stocked at 90 percent**
- c. Fully stocked at 100 percent
- d. Overstocked at 105 percent
- e. Overstocked at 110 percent



STOCKING TABLE

14. (4 pts) Label each of the trees below as “Dominant”, “Co-dominant”, “Intermediate”, or “Suppressed”:



15. (2 pts) Describe the difference between the Co-Dominant and Intermediate crown classes:

Co-dominant are medium sized crowns that form the general crown cover (canopy) and receive sunlight from above. Intermediate and small-crowned and shorter trees that just reach into the general canopy and receive little direct sunlight. Intermediate crown class trees may also be referred to as the under story.

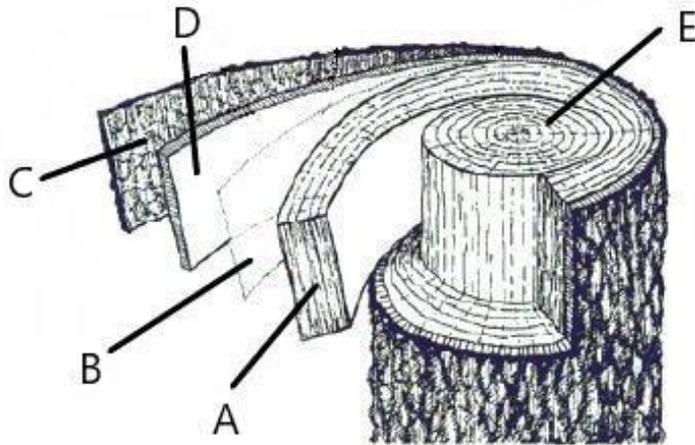
(One point for canopy position, one point for sunlight level)

16. (7 pts) A consulting forester determined the site index in two areas of Mrs. Jones’ property using a base age 50 diagram. Plot 1 has a site index of 70. Plot 2 has a site index of 100.

- Which crown classification is used to determine site index? Dominant
- What is one measurement the consulting forester had to know or measure to determine site index? Tree height or Tree age
- What is the difference between Plot 1 and Plot 2 on Mrs. Jones’ property?
Plot 1 is a lower quality site that will grow shorter trees than Plot 2 when measured and compared at age 50.

(Two points for A, Two points for B, Three points for C)

17. (10 pts) Label the parts of the tree and identify the purpose of each:



*Tree Part Label
(Letter)*

*Tree Part Function Label
(Number)*

Tree Part Functions

___ C ___

BARK

___ 4 ___

1. Carries nutrients and water from the roots to the crown of the tree

___ B ___

CAMBIUM

___ 3 ___

2. Provides support and strengthens the tree

___ E ___

HEARTWOOD

___ 2 ___

3. A layer of living tissue that forms new cells

___ D ___

PHLOEM

___ 5 ___

4. Protects the tree from pests, diseases, etc.

___ A ___

XYLEM

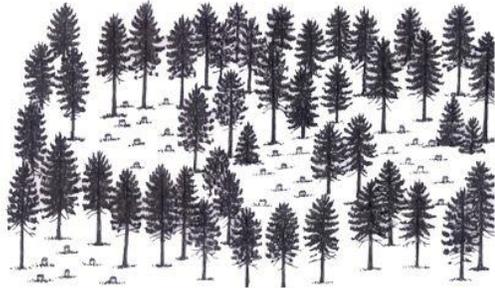
___ 1 ___

5. Moves glucose from the leaves to the rest of the tree and roots

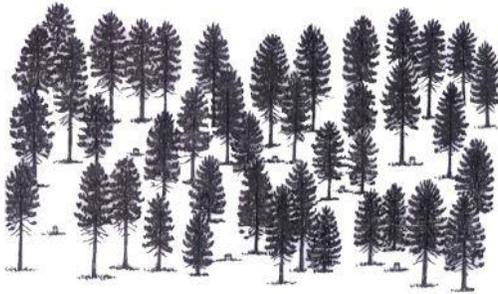
18. (5 pts) Label each picture with the correct silviculture practice:
(image source: <https://www.nrs.fs.fed.us/fmg/nfmg/fm101/silv/index.htm>)



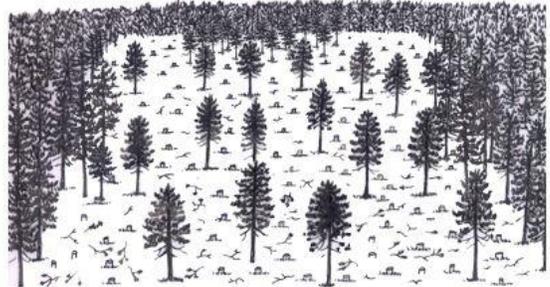
A. _____



B. _____



C. _____



D. _____



E. _____

- A. Clearcut
- B. Group Selection
- C. Single Tree
- D. Seed Tree
- E. Shelterwood

19. (3 pts) List three factors that determine forest type:

Elevation, topography (slope), annual rainfall, soil type/depth, exposure to elements (harsh weather)

20. (6 pts) Use the following word bank to identify the forestry tool, then describe what it is used for in the field.

Abney Level	Chainsaw	Flagging	Staff Compass
Altimeter	Clinometer	Handheld Compass	Stereoscope
Biltmore Stick	Densitometer	Increment Borer	Tally Meter
BMP Manual	Dot Grid	Loggers Tape	Tree Marking Gun
Calipers	Driptorch	Soil Auger	Wedge Prism

- A. Identify this forestry tool. **Driptorch**
What is it used for? **Used to ignite fuels as part of a prescribed burn or wildfire operations to burn out vegetative fuel**
- B. Identify this forestry tool. **Densitometer**
What is it used for? **Used for measuring the density of canopy cover**
- C. Identify this forestry tool. **Increment Borer**
What is it used for? **Used to take core samples to determine the rate of a tree's radial growth and its age**

(One point for each correct identification, one point for each correct use)

21. (2 pts) Using a clinometer, measure the slope of the terrain between points "19A" and "19B".

Answer to be determined on site (Two points for in range of +/- 2%, One point for +/- 5%)

22. (6 pts) Looking around, you will see that there is a thick, invasive non-native understory which is considered to be bad for the long-term health of the forest. Identify three negative impacts to the forest system of this invasive understory.

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