

Team Number:

Color:

2006 California Envirothon
Forestry Station
Total 100 points possible
Time Allowed: 35 minutes

Please write team number on top of each page of test. You may unstaple the test and work on questions in any order; however, pages should be returned to correct order when test is turned in. You may choose to split your team up and work on multiple questions at once or work on questions together. Please show all work, as you may receive partial credit where possible.

PART I, WRITTEN EXAMINATION (50 POINTS POSSIBLE)

1. Circle the correct answer. An individual who practices forestry in California on state and private land must: (1 points)
 - a) Have a college degree in Forestry
 - b) Be a Registered Professional Forester (RPF) or be directly supervised by an RPF
 - c) Be a California resident
 - d) Know a forester

2. List 3 examples of state or federal environmental legislation relating to the practice of forestry: (3 points)
 - 1.
 - 2.
 - 3.

3. Write in the blank, each forestry term described below: (8 points)
 - a. A species-specific measure of actual or potential forest productivity, expressed in terms of the average height of trees included in a specified stand component at a specified index or base age.

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- b. The conversion of water within plants into water vapor that is released to the atmosphere.

- c. A stand of a single species, generally even-aged

- d. A planned sequence of treatments designed to maintain and regenerate a stand with three or more age classes

- e. A layer of cells just inside the bark of plants that conducts food from the leaves to the stem and roots.

- f. The principal water-conducting tissue of higher plants, composed of tracheids, vessels, fibers and parenchyma.

- g. The cross-sectional area of a single stem, including the bark, measured at breast height.

- h. A standing, generally unmerchantable dead tree from which the leaves and most of the branches have fallen.

4. You are measuring a redwood tree with a clinometer. However, due to the tall brush you cannot get a good view of the top of the tree. To get a better view, you measure out 100-feet (horizontal distance) uphill from the tree. You pull out your clinometer and "shoot" both the bottom and top of the tree. The reading you get at the base of the tree is (-18%). The reading you get at the top of the tree is (+127%). (1 point)

The height of the tree is 145 feet.

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5. Match each of the silvicultural systems (also referred to as regeneration methods) a) through e) to the descriptions below. (5 points)

- a) Clearcut
- b) Seedtree
- c) Shelterwood
- d) Single-tree selection
- e) Group selection

_____ The cutting of most trees, leaving those needed to produce sufficient shade to produce a new age class in a moderated microenvironment

_____ Individual trees of all size classes are removed more or less uniformly throughout the stand, to promote growth of remaining trees and to provide space for regeneration.

_____ Trees are removed and new age classes are established in small groups.

_____ A stand in which essentially all the trees have been removed in one operation

_____ The cutting of all trees except for a small number of widely dispersed trees retained for seed production and to produce a new age class in fully exposed microenvironment.

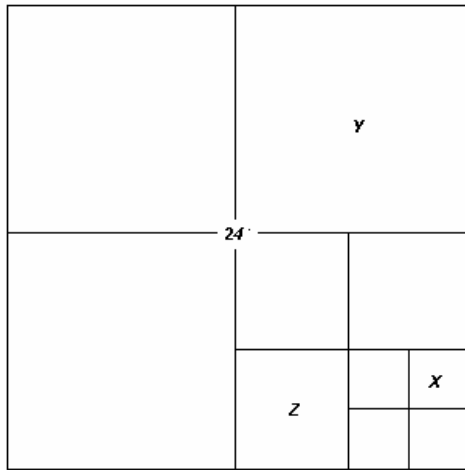
6. Trees common to this area are listed below. Please fill in the appropriate blanks with either the common name, Genus or species that corresponds to each (6 points)

| <u>Common Name</u> | <u>Genus</u> | <u>Species</u> |
|--------------------|--------------|----------------|
| Redwood | _____ | _____ |
| _____ | Pseudotsuga | menziesii |
| tanoak | Lithocarpus | _____ |
| Ponderosa Pine | Pinus | _____ |
| Coast Live Oak | _____ | agrifolia |

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7. Using the Section diagram below, provide a detailed legal description for X: (3 points)



X) _____ 1/4 of the _____ 1/4 of the
_____ 1/4 of Section 24

(7 cont.) Again, referring to the Section diagram, determine the acreage of the box associated with letters Y, and Z ? (2 points)

Y) _____

Z) _____

8. Using the maps attached, provide the following (ruler will be provided). There are two maps attached. One shows an overview of the area on a 1:24,000 scale. The second map shows the detailed location of a Management Area and a Bird at a 1:12,000 scale: (4 points)

a) Give the proper legal description of the management area, as designated on the attached map, to the nearest 1/4 section. Assume the Township to be T2N, and the Range R1E.

b) How close (in feet) is the endangered bird to the management area, at closest? (hint: 1:12,000 means 1 foot on the map = 12,000 feet on the ground)

c) What is the elevation of the endangered bird site?

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d) What is the aspect of the management area?

10. What are the three sides of the "Fire Triangle" (3 points)

e) _____

f) _____

g) _____

11. Short Answer: What is the value of fire in a forest ecosystem (Name three things)? (3 points)

a) _____

b) _____

c) _____

12. Name (2) ways redwood regenerate? (2 points)

a) _____

b) _____

13. Circle the correct answer. The current increase in instances of wildfire across the U.S. can be explained by:

(1 point)

- a) Past fire suppression policies, including on the "total suppression", which allowed for the accumulation of fuel in the form of fallen leaves, branches, and excessive plant overgrowth in forest and wildland areas.
- b) Increasingly dry, hot weather in certain geographic areas.
- c) Increased residential development in the wildland/urban interface.
- d) All of the above.

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14. Circle the correct answer. The number one cause of tropical deforestation worldwide is: (1 point)

- a. commercial logging.
- b. wildfire.
- c. clearing of lands for agricultural use.
- d. gathering of firewood.
- e. building of roads and cities.

15. Circle the correct answer. Which of the following statements most accurately describes United States forests: (1 point)

- a. forest harvest exceeds net forest growth by 8 percent.
- b. forest harvest exceeds net forest growth by 3 percent.
- c. forest harvest roughly equals net forest growth.
- d. net forest growth exceeds harvest by 19 percent.
- e. net forest growth exceeds harvest by 50 percent.

16. True (T) or False (F). California imports nearly 80% of the wood we use in the state. (1 point)

17. Of the most common building materials; brick, concrete, aluminum, steel, wood and plastic, wood can be produced with the least impact on the environment.

Briefly explain why this is true. (3 points)

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Fill in the missing word for each statement:

18. (1 point) Carbon sequestration is the uptake and storage of carbon. Trees and plants, for example, absorb _____, release the oxygen and store the carbon.

19. (1 point) Carbon sinks are carbon reservoirs and conditions that take-in and store more carbon (i.e., carbon sequestration) than they release. Carbon sinks can serve to partially offset greenhouse gas emissions. _____ and oceans are large carbon sinks.

END OF PART I

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PART II, FIELD EXAMINATION (50 POINTS POSSIBLE) – Show your work

Your team has recently started a forestry consulting firm, Coastal Forestry Consultants. Your firm has been asked to prepare a preliminary assessment of a client's property. Your new client, Douglas Furr owns 150 acres of Forestland in the Santa Cruz Mountains. Mr. Furr doesn't have much money, so you can't spend much time working on his property. You'll have to get what information you can, and then extrapolate that information to fit the whole property.

Mr. Furr shows you where he wants you to put the one and only variable cruise plot. He gives you a 20-factor prism and says "good luck".

1. Using the prism, how many "in" trees do you have from your plot center? (4 points)

_____ "in" trees.

2. What is the average square feet of basal area per acre for redwood only, based on your cruise plot and calculations? (4 points)

_____ square feet of basal area per acre.

3. Using the key provided, determine the species of the tree flagged with red and white striped flagging. (2 points)

Select either Tree A or Tree B and give the measurements below:

4. Using the clinometer, what is the total height (to the nearest foot) of the tree you measured? (5 points)

Tree A Height _____ OR Tree B Height _____

+/- 1 or 2 feet = 5 points

+/- 3 or 4 feet = 4 points

+/- 5 or 6 feet = 3 points

+/- 7 or 8 feet = 2 points

+/- 9 or 10 feet = 1 point

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5. Using the diameter tape, what is the diameter at breast height (dbh) to the nearest inch, of either tree A or tree B? (5 points)

Tree A _____ or

Tree B _____

6. Using the Merritt Hypsometer, how many 16-foot logs are in Tree C ? (hint: round answer down to nearest whole log) (5 points)

Number of 16-foot logs _____

7. Mr. Furr points out a large redwood tree to you, which is adjacent to the property. He believes there is an endangered bird living in that tree. He would like to know a couple of things about that tree: From your plot center
- a) how far away is the tree? And
- b) Using the compass provided, what is the bearing (for example North 36° East) from the plot center to the tree?
- (5 points)

a) _____

b) _____

Partial credit for numbers 1 to 4 feet or degrees off.

Just as your firm finishes collecting the preliminary data, Mr. Furr shows up. He provides you with some additional information to help complete your analysis. You are given a local volume table (Fig. 2). Mr. Furr tells you that Logging costs average \$100 / thousand board feet and that Redwood is currently selling for \$500 / thousand board feet. In Santa Cruz County, the law states that you can only harvest 50% of the standing volume. Finally, he says that he doesn't want you using your data, but that you should use his data. He says that he has one 20 inch diameter redwood, one 24 inch diameter redwood and one 38 inch diameter redwood per acre. Mr. Furr wants to harvest as much as he can. Given this information, Mr. Furr would like to know the following:

8. Using Mr. Furr's variable cruise plot results, and the local volume table, estimate how much volume (in Scribner board feet) Mr. Furr has over his entire 150-acre property? (hint: You do not need to measure anything. Using the information given, use math) (5 points)

a) _____ Scribner board feet

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**Fig 2. Santa Cruz Local Volume Table
(Scribner Board Foot Volumes)**

| DBH | Douglas-fir | Redwood |
|-----|-------------|---------|
| 18 | 220 | 195 |
| 20 | 310 | 285 |
| 22 | 420 | 390 |
| 24 | 550 | 510 |
| 26 | 700 | 650 |
| 28 | 880 | 800 |
| 30 | 1080 | 965 |
| 32 | 1300 | 1150 |
| 34 | 1570 | 1340 |
| 36 | 1830 | 1560 |
| 38 | 2100 | 1800 |
| 40 | 2400 | 2060 |
| 42 | 2750 | 2340 |

9. How much volume (in board feet) can Mr. Furr harvest in Santa Cruz County? (5 points)

_____ board feet

10. How much would it cost to log this property (considering what can be cut)? (5 points)

11. How much money can Mr. Furr expect to make if he logs 50% of the standing volume?
(5 points)

End of Exam!

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