

**Professional Foresters Registration Examination**

**OCTOBER 22, 2010**

Part I

**Applicant Must Answer Question I - Short Answer**

Question I - Short Answer

**Applicant Must Also Answer Two of the Remaining Essay Questions in Part I**

Question II - Forest Mensuration

Question III - Forest Ecology

Question IV - Forest Economics

Question V - Forest Protection

Professional Foresters Registration  
1416 9th Street, Room 1506-16  
Sacramento, CA 95814

**You MUST answer this Question to pass the examination.**  
**Answer on these pages, tear from the booklet and submit with the answer packet**

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**ACRONYMS AND ABBREVIATIONS USED IN THIS EXAMINATION**

The following Acronyms and /or Abbreviations **may be used** in this examination. Technical abbreviations that should be known by a forester are NOT included here (e.g. DBH, MAI, MBF). You may remove this page for reference throughout this examination. **It need not be returned.**

<b><u>Acronym or Abbreviation</u></b>	<b><u>Full Text</u></b>
BOF	California State Board of Forestry and Fire Protection
CCR	California Code of Regulations
CDFFP	California Dept. of Forestry and Fire Protection
FPR	California Forest Practice Rules
PRC	California Public Resources Code
RPF	California Registered Professional Forester
THP	California Timber Harvest Plan
TPZ	California Timber Production Zone

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**QUESTION I - SHORT ANSWERS**

4%     1. According to the definitions in the FPR (CCR 895.1), what stream order is required for a planning watershed and generally what is the maximum acreage for a planning watershed?

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3%     2. Define *ad valorem* tax and give an example of a forest asset taxed in this manner in California.

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4%     3. To reduce current fuel hazard on timberlands, there are many different permitting options available that do not require a THP. Name two of these options that require the Quadratic Mean Diameter (QMD) of the remaining stand to be increased.

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3%     4. Under the Forest Practice Act regulations governing "nonindustrial timberland", list three characteristics which define a nonindustrial tree farmer".

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3%     5. Dunning's Classification is used to classify which species of conifers in the FPRs?

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3%     6. Name three retention practices recommended for stand treatments to maintain options for spotted owls on timberlands in the Sierra Nevada?

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- 4%    7. As used in the FPRs, what is meant by the term “Properly Functioning Salmonid Habitat”?

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- 3%    8. A geomorphic feature formed by coalescing scars originating from landsliding and erosional processes caused by active stream erosion. The feature that is identified as the area beginning immediately adjacent to the stream channel below the first break in slope is termed an

\_\_\_\_\_ .

- 4%    9. High definition remote sensing mapping products called LIDAR images are becoming more common in forestry and natural resource use. Briefly describe the technology creating these images.

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- 3%    10. In the forest, there are likely to be life forms other than trees and shrubs. List three life forms of **herbaceous plants** likely to be found in a forest type in temperate North America (common or scientific names are acceptable).

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- 3%    11. How does the annual harvest of timber in California in calendar year 2009 compare with the previous 10-year average (1999-2008)? Circle the answer most nearly correct.
- A. 100 to 110% of 10-year average
  - B. 80 to 99% of 10-year average
  - C. 60 to 79% of 10-year average
  - D. 40 to 59% of 10-year average

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3% 12. An agreement between the Secretary of the Interior and either a private entity or another governmental agency, specifying the conservation that will be implemented in exchange for a permit that would allow the incidental taking of a threatened or endangered species is called a \_\_\_\_\_ (Write out the entire answer, no acronyms).

3% 13. In a THP, what term is used for an area where the use of heavy equipment associated with timber operations is intentionally limited for the protection of water quality, the beneficial uses of water, and/or other forest resources.

\_\_\_\_\_

3% 14. Is the following statement true or false, and briefly state why: Establishing a ponderosa pine plantation adjacent to a residual white fir overstory infected with dwarf mistletoe represents a high risk of spreading the mistletoe to the new understory.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

3% 15. You are standing on point A and looking upslope to point B. Point B is 220 ft, slope distance from you, and your abney shows the slope is +22%. How much higher is point B than A? \_\_\_\_\_.

3% 16. Differentiate between current annual increment and mean annual increment for a given tree?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

4% 17. Briefly describe how the Z'Berg-Nejedly Forest Practice Act, the Public Resources Code, and the California Code of Regulations relate to one another.

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3% 18. You wish to thin a stand of trees to an average 16ft x 16 ft square spacing. How many trees per acre would your thinned stand have on the average acre?

\_\_\_\_\_

3% 19. A practice or usually a combination of practices that are determined by a state or a designated planning agency to be the most effective and practical means of controlling point and nonpoint sources of pollutants at levels compatible with environmental quality goals is called a \_\_\_\_\_  
(answer is to be given in complete form, not as an abbreviation).

3% 20. Which of the following tree species are susceptible to white pine blister rust: *Pinus monticola*, *Pinus lambertiana*, *Pinus ponderosae*, *Pinus sabiniana*, *Pinus attenuata*, *Pinus contorta*?

\_\_\_\_\_  
\_\_\_\_\_

4% 21. According to the definition in the FPR, define the two conditions required in the abandonment of a forest road.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3% 22. The volume, basal area, or number of trees in a stand that were smaller than a prescribed minimum diameter or height limit at the beginning of any measurement period and that, during that period, attain the prescribed size is called \_\_\_\_\_.

4% 23. For THP planning purposes, how would you define an “Active Nest” of an Osprey when you have not seen an Osprey occupy the nest in the 3 months you have been doing the THP fieldwork?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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3%     24. List **three** compatible uses, besides tree growing and harvesting, that may occur on lands zoned TPZ, according to the California Yield Tax Law (disregard local or county defined compatible uses).

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3%     25. A nonmonetary and rarely calculable toll on society arising from any form of economic activity is termed a \_\_\_\_\_

3%     26. When an alien or exotic species can establish, grow, reproduce, and maintain itself in an area where it did not originally grow, it is said to be

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3%     27. According to the FPR, which silvicultural method is used to develop an uneven-aged stand from a stand that currently has an unbalanced irregular or even-aged structure? This method is used no more than twice to increase stocking and improve the balance of age classes so as to allow the residual stand to be managed by selection or group selection.

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3%     28. How do the Forest Practice Rules define "feasible"?

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3%     29. In forest fires and other larger public emergencies within the US, a particular organizational system is used to manage the facilities, personnel, participating organizations, equipment and other resources and needs of the emergency. Name this organizational system. (Do not abbreviate)

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3%     30. Briefly discuss why a conventional high-lead logging system is not suitable for logging a partial cut harvest unit on steep terrain.

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Applicant #: \_\_\_\_\_  
Question #   I  

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3%    31. What is the "coefficient of variation" used to measure?

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**END OF QUESTION**

## QUESTION II - FOREST MENSURATION

**OBJECTIVE:** To evaluate your mensuration knowledge and ability to estimate the standing volume and annual growth of timber stands.

**SITUATION:** You are a consulting forester working for a family forest owner with 36 acres of pure, young growth Ponderosa pine that was planted after a stand replacing wildfire, 70 years ago. The owner Mr. Peters says that his grandfather and father have both managed the property before him. He knows that there have been firewood and both non-commercial and commercial thinning cuts done in the past at irregular intervals to remove poorly formed trees, improve spacing, and to improve growth on future crop trees.

Mr. Peters would like to have you do a **preliminary forest stand description** of what he has on his small forest. For the present, he is only willing to pay you for no more than three or four days work at this time, but in the future he may decide to have a long-term forest management plan drawn up. You inform him that for the time and money he is presently willing to spend, you can only do a cruise sufficient to produce a stand and stock table for gross volumes and some limited growth information and prediction, but you will **not be able to address** net volumes, log grades, or monetary values.

Your preliminary walk-through evaluation of the 36 acres is that the entire property is pretty much of the same site class and stand characteristics (density, diameter distribution, etc). Therefore, you do not see a need to stratify the ownership. The 36 acres looks to be pure Ponderosa pine and well to possibly over stocked. You decide on the following cruise methods to match the owner's objectives and the time and money available for this work:

### **Methods Used:**

1. Fixed radius plot cruise- 10 plots systematically located across the farm forest, 1/20 ac. plots;
2. Volume determination by Ponderosa pine Tariff Access Table (condensed from VARPLOT Scribner Tables, 32 ft logs to a 5inch top);
3. Growth data from 10 sample trees which will also be the Tariff tree on each plot; last 5 years of radial growth collected.

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**Resources and Data Provided:**

1. The plot data collected are shown on the Sample Tree Tally Card on page 12. Note that this Sample Tree Tally Card is Incomplete as given.
2. A blank Volume Computation Form on page 13.
3. Tariff Access Table for Ponderosa pine on page 14.
4. A Tree Volume Table (Scribner volume table, 32 ft logs to a 5-inch top) on page 15.

**QUESTIONS:**

**IMPORTANT-READ THIS BEFORE BEGINNING WORK:** For all questions, the answer must be written in the box provided with the question. The computational worksheets are provided to help you organize your data and computations. However, while you may remove the various worksheets and tables from the examination, to help in your progress with this question, **you must turn in the various worksheets and tables with your examination. Put your application number in the space provided on each Resources and Data page provided for this question. Failure to do so will result in failing the ENTIRE question.**

- 5%      1. Based on the plot-sampling scheme, what is the sampling intensity of this cruise?

Cruise Sampling intensity (nearest 0.1%) =

- 15%      2. For the diameter classes present in the sample, determine the Total Trees Per Acre (TPA) by diameter class and for the average stand acre.  
Enter the TPA answers in the appropriate spaces below.

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Diameter (inches)	Total Trees Per Acre
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
Total	

5% 3. Determine the average radial growth for the stand for the last 5 years. Enter the average stand radial growth in the answer space below.

Average Radial Growth (nearest 0.01 inches) =	
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15% 4. Determine the Average Board Foot Volume per Acre for this stand (Scribner, 32 ft logs, 5 inch top). Write the answer in the space provided below.

Average Board Foot Volume per Acre =	
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10% 5. What is the Total Basal Area Per Acre for this stand, based on the sampling data? Write the answer in the space provided below.

Total Basal Area Per Acre (ft <sup>2</sup> ) =	
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5%      6. What is the Average Basal Area Per Tree? Write the answer in the space provided below (nearest 0.1 ft<sup>2</sup>).

Average Basal Area Per Tree (ft <sup>2</sup> ) =	
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15%      7. What is the Quadratic Mean Diameter (QMD) of this stand? Write the answer in the space provided below.

Quadratic Mean Diameter (nearest 0.1 inches) =	
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10%      8. Why is the QMD often favored in Mensuration descriptions of a stand rather than the arithmetic average diameter?

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15% 9. Determine the Board Ft. Volume/acre (32 foot logs, 5-inch top diameter, Scribner Log Rule) by diameter class and for a typical acre. Write the answers in the appropriate spaces provided below.

<b>Diameter (inches)</b>	<b>Board Feet Volume/Acre</b>
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
Total	

5% 10. Assume that instead of the uniform stand that is in this problem, this property has a predominately younger stand with several significantly older and larger Ponderosa pine trees per acre scattered throughout. Briefly discuss how you would adjust your sampling and volume estimation methods, using the same basic tariff table methodology?

**END OF QUESTION**

**RESOURCE AND DATA TABLES FOLLOW  
ON PAGES 13-16**

**OCTOBER 2010 RPF Examination**

Applicant No. \_\_\_\_\_

**Tree Tally Card**

User name \_\_\_\_\_ Plot size \_\_\_\_\_ Multiplication factor\* \_\_\_\_\_  
 Stand name PETER'S PINES Species PP Average tariff number \_\_\_\_\_  
 Date RPF TEST DAY Stand age ~70 yrs

DBH (in.)	Plot number										Total trees	Total trees per acre
	1	2	3	4	5	6	7	8	9	10		
7												
8												
9	•				•						2	
10		•		•		•	•			•	6	
11		•		•		•	•				4	
12	•	•	•	•	•	•	•	•		•	9	
13	•	•	•	•	•	•	•	•	•	•	11	
14	•	•	•	•	•	•	•	•	•	•	10	
15	•	•	•	•	•	•	•	•	•		7	
16	•	•	•	•	•	•	•	•	•	•	8	
17		•		•		•		•	•	•	6	
18	•		•		•		•		•	•	7	
19		•		•							2	
20						•			•	•	3	
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												
											Total	

Plot no.	DBH (in.)	Height to nearest 5 ft.	Radial growth for 5 yrs. (in.)	Tariff no. from access tables
1	18	95	0.6	
2	12	70	0.5	
3	14	75	0.4	
4	19	100	0.6	
5	17	90	0.5	
6	13	70	0.6	
7	15	85	0.5	
8	15	80	0.6	
9	20	110	0.7	
10	10	50	0.5	
Total				
Average				

\* Multiplication factor =  $\frac{\text{Plot size correction factor}}{\text{Number of plots}}$

- Dot count key
- = 1
  - = 2
  - = 3
  - = 4
  - |• = 5
  - ┌ = 6
  - = 7
  - ◻ = 8
  - ◻ = 9
  - ◻ = 10

**Remember**  
 The first tree from each plot is recorded as a Plot Tree **and** as a Tariff Tree.

Recommended plot sizes	Distance between trees			
	less than 8 ft.	8-16 ft.	16-24 ft.	more than 24 ft.
Plot size (acres)	1/100th	1/50th	1/20th	1/10th
Plot radius (ft. & in.)	11'10"	16'8"	26'4"	37'2"
Plot radius (ft.)	11.8	16.7	26.3	37.2
Plot size correction factor	100	50	20	10

Applicant No. \_\_\_\_\_

**Volume Computation Form**

Stand name \_\_\_\_\_ Date \_\_\_\_\_  
 Species \_\_\_\_\_ Average radial growth \_\_\_\_\_  
 Stand age \_\_\_\_\_ Average basal area/tree \_\_\_\_\_  
 Average tariff number \_\_\_\_\_ Average stand diameter \_\_\_\_\_  
 Multiplication factor \_\_\_\_\_ Board-foot volumes (16' or 32') \_\_\_\_\_

	1	2	3	4	5	6	7
DBH	Trees/ acre	Board ft. vol./tree (from Tree Volume Tables)	Board ft. vol./acre (col. 1 x col. 2)			Basal area/tree	Basal area/acre by diameter class (col. 1 x col. 6)
7						0.267	
8						0.349	
9						0.442	
10						0.545	
11						0.66	
12						0.785	
13						0.922	
14						1.069	
15						1.227	
16						1.396	
17						1.576	
18						1.767	
19						1.969	
20						2.182	
21						2.405	
22						2.64	
23						2.885	
24						3.142	
25						3.409	
26						3.687	
27						3.976	
28						4.276	
29						4.587	
30						4.909	
31						5.241	
32						5.585	
33						5.939	
34						6.305	
35						6.681	
36						7.068	
	Total trees/acre		Total board-foot volume/acre		Total cubic-foot volume/acre		Total basal area/acre

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Appendix A3.—Tariff access table for **ponderosa pine**. Condensed from W&PLOT Tree Volume Tariff Access Tables (2002).

	Height (ft)																											
	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
7	14	18	20	22	24	27	29	31	32	34	36	38	40	42	43	45												
8	15	16	18	21	23	25	27	28	31	34	36	38	40	42	43	45												
9	15	16	18	20	22	24	26	28	30	32	34	37	38	40	43	45												
10	15	17	19	20	23	25	27	29	31	33	35	37	39	41	43	45												
11	15	17	18	20	22	24	26	28	30	32	34	36	38	40	42	44	45											
12	15	16	18	20	22	23	25	27	29	31	33	35	37	38	40	42	44											
13	15	16	18	19	21	23	25	27	28	30	32	34	36	37	39	41	43	45										
14	15	18	19	21	22	24	26	28	30	31	33	35	37	39	40	42	44											
15	15	17	18	20	22	24	25	27	29	31	33	34	36	38	40	41	43	45										
16	15	16	18	20	21	23	25	27	28	30	32	34	35	37	39	41	42	44										
17	15	16	18	19	21	23	25	26	28	30	31	33	35	36	38	40	42	44	45									
18	15	16	18	19	21	23	24	26	28	30	31	33	34	36	38	39	41	43	45									
19	15	16	17	19	21	22	24	25	27	29	30	32	34	36	37	39	41	42	44									
20	15	16	17	19	20	22	24	25	27	28	30	32	33	35	37	38	40	42	44	45								
21	15	17	19	20	22	23	25	27	28	30	31	33	35	36	38	40	41	43	45									
22	15	17	18	20	21	23	25	26	28	29	31	33	34	36	38	39	41	43	44									
23	15	17	18	20	21	23	24	26	28	29	31	32	34	35	37	39	41	42	44									
24	15	17	18	20	21	23	24	26	28	29	31	32	34	35	37	38	40	42	43	45								
25	15	16	18	19	21	22	24	26	27	29	30	32	33	35	37	38	40	41	43	45								
26	15	16	18	19	21	22	24	25	27	28	30	32	33	35	36	38	40	41	43	44								
27	15	16	18	19	21	22	24	25	27	28	30	31	33	35	36	38	39	41	42	44								
28	15	16	17	19	20	22	23	25	27	28	30	31	33	35	37	39	41	42	44	45								
29	15	16	17	19	20	22	23	25	26	28	29	31	33	34	36	37	39	40	42	43	45							
30	15	16	17	19	20	22	23	25	26	28	29	31	33	34	35	37	38	40	42	43	45							
31	15	16	17	19	20	22	23	25	26	28	29	31	32	34	35	37	38	40	41	43	44							
32	15	16	17	19	20	21	23	24	26	27	29	30	32	33	35	36	38	40	41	43	44							
33	15	16	17	18	20	21	23	24	26	27	29	30	32	33	35	36	38	39	41	42	44	45						
34	15	17	18	20	21	23	24	26	27	29	30	32	33	35	36	38	39	41	42	44	45							
35	15	17	18	20	21	23	24	25	27	28	30	31	33	34	36	37	39	41	42	43	45							
36	15	17	18	20	21	23	24	25	27	28	30	31	33	34	36	37	39	41	42	43	45							



### QUESTION III-FOREST ECOLOGY

#### OBJECTIVE

To test your understanding of the effect of environmental characteristics on the physiological processes of trees.

#### SITUATION

The ring width measurements shown below were taken from two similar age lodgepole pine trees grown in adjacent, but different, environments in the same watershed at approximately 6,580 feet elevation in the Sierra Nevada Mountains.

Both trees were open grown and had not been affected by competition with trees or other plants. Assume that the precipitation pattern is the same for both trees and precipitation is only a minor factor regulating tree growth and cannot explain the growth difference between the two trees.

Table 1. Environmental Characteristics for Both Trees

<u>Tree</u>	<u>Environment Characteristics</u>
1	Rocky slope: 200 feet above valley floor; cold air drainage pattern; southwestern exposure; adequate soil drainage, soil pH 6.0.
2	Peaty flat in valley floor; cold air drainage pattern; horizontal exposure; inadequately drained soil; soil pH 4.5.

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Table 2. Growth rates for both trees.

Year	Precipitation (in.)	Ring Widths	
		Tree 1	Tree 2
1975	46	0.10	0.03
1976	52	0.15	0.01
1977	48	0.11	0.03
1978	37	0.05	0.10
1979	45	0.09	0.03
1980	53	0.16	0.01
1981	55	0.15	0.01
1982	51	0.13	0.01
1983	48	0.10	0.03
1984	50	0.11	0.02
1985	45	0.09	0.03

**QUESTION**

Noting the difference in growth rate trends for Tree 1 and Tree 2, compare the **specific tree Environment Characteristics** (described in table above and itemized below) to explain the overall difference between trees. Include how those characteristics relate to specific physiological processes. (Assume the differences are not the result of genetics.)

- 20% 1. The effects that topographic position might have on the trees' growth.
- 20% 2. The effects that differing cold air drainage patterns might have on the trees' growth.
- 20% 3. The effects that differing exposures might have on the trees' growth.
- 20% 4. The effects that differing soil drainage might have on the trees' growth.
- 20% 5. The effects that differing pH might have on the trees' growth.

**END OF QUESTION**

**OCTOBER 2010 RPF Examination**

## QUESTION IV-FOREST ECONOMICS

### OBJECTIVE

To determine your understanding of basic economic theory as it applies to forest products and markets.

### SITUATION

The current recession (circa 2008-2010) has led to some of the worst conditions for the forest products industry since the end of World War II. However, from January through April 2010, the price of Douglas-fir and other framing/construction lumber and structural construction panels (e.g. OSB, plywood) spiked. An example of prices (from the publication, “Random Lengths-July 7, 2010) during this period is shown below:

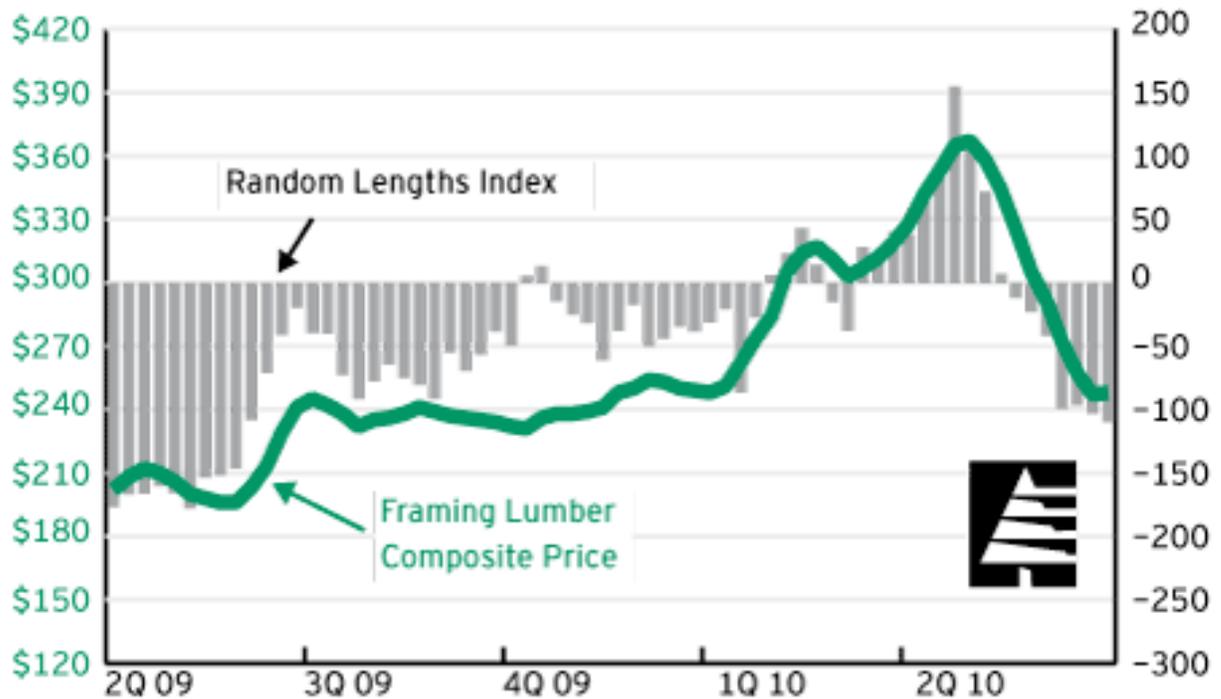


Figure 1: From the Random Lengths July 7, 2010 Weekly Snapshot. The Random Lengths Framing Lumber Composite Price is an aggregated price for all species used in the framing lumber category (in the western U.S. is primarily Douglas-fir). The Random Lengths Index is a relative index of prices based on a baseline value.)

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In the first and second quarters of 2010, framing lumber reached a price higher than any month since May of 2006. Housing starts and other economic activity marginally increased over 2009, but were still roughly a third of what they were in 2006. However, by June of this year, the lumber and log markets returned to about where they were prior to the price spike.

## **QUESTION**

20% 1. Discuss what events led to this short-term behavior in the Douglas-fir log and lumber market.

30% 2. Explain the relationship of these changes in price and harvest volume in terms of simple economic concepts. Draw a graph showing the relationship of price, harvest volume and demand that reflects conditions both before and after these changes occurred.

20% 3. In addition to new home construction, briefly describe two (2) other major domestic markets that utilize or consume dimension lumber.

30% 4. Discuss how a change (increase and decrease) in stumpage price in California might affect:

- a. log imports/exports
- b. non-wood building materials
- c. land use, land management and environmental concerns

**END OF QUESTION**

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## QUESTION V- FOREST PROTECTION

### OBJECTIVE

To assess your knowledge about insects which are damaging to wildland tree species in California.

### QUESTION

30% 1. Name and describe three (3) important insects (common names acceptable) which could contribute to major damage to western forest wildland trees. Name and describe one species of defoliator, one species of bark beetle, and one species of woodborer. Describe one main forest tree species that each of the three insects that you have chosen would normally target.

30% 2. For each insect used in Question 1, describe how a forester in the field would identify the insect in the host tree without actually seeing that insect.

20% 3. Assume an RPF determines that insect damage in trees on a tract of commercial timberland warrants immediate harvesting to prevent a loss of tree resources, or that there is otherwise a need to control or prevent the build-up of a destructive insect population. Briefly describe the two actions that can be taken under the Forest Practice Act and rules that will allow for the harvesting of trees to begin immediately. Include six (6) RPF responsibilities that exist in the CCRs in implementing these actions.

10% 4. Assume your client has insect damaged hardwood trees that could result in a loss of tree resources to the owner. What would determine if you need a State permit to harvest?

10% 5. Briefly describe **five** ecological roles that the insects you used in Question 1 may serve in the forest under endemic, rather than epidemic, population levels.

**END OF QUESTION**

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**Part II**

**Applicant Must Also Answer Three Of The Remaining  
Five Essay Questions In Part II**

Question VI-Forest Engineering  
Question VII-Silviculture  
Question VIII-Forest Administration  
Question IX-Forest Policy  
Question X-Forest Management

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## QUESTION VI-FOREST ENGINEERING

### OBJECTIVE

To determine the applicant's knowledge of harvesting equipment selection and basic harvesting system concepts.

### SITUATION

Each harvest unit has a set of management objectives that likely include aspects of safety, profitability, residual stand structure and composition, water quality, and legal, social and regulatory concerns. If the equipment and system chosen for a unit are mismatched to the site and stand conditions, then it may be impossible to achieve any or all of these objectives. The ramifications of improper equipment selection may range from unsafe working conditions to unacceptable costs to violations under the forest practice regulations. Making sound choices aims to reduce the risk of those events happening.

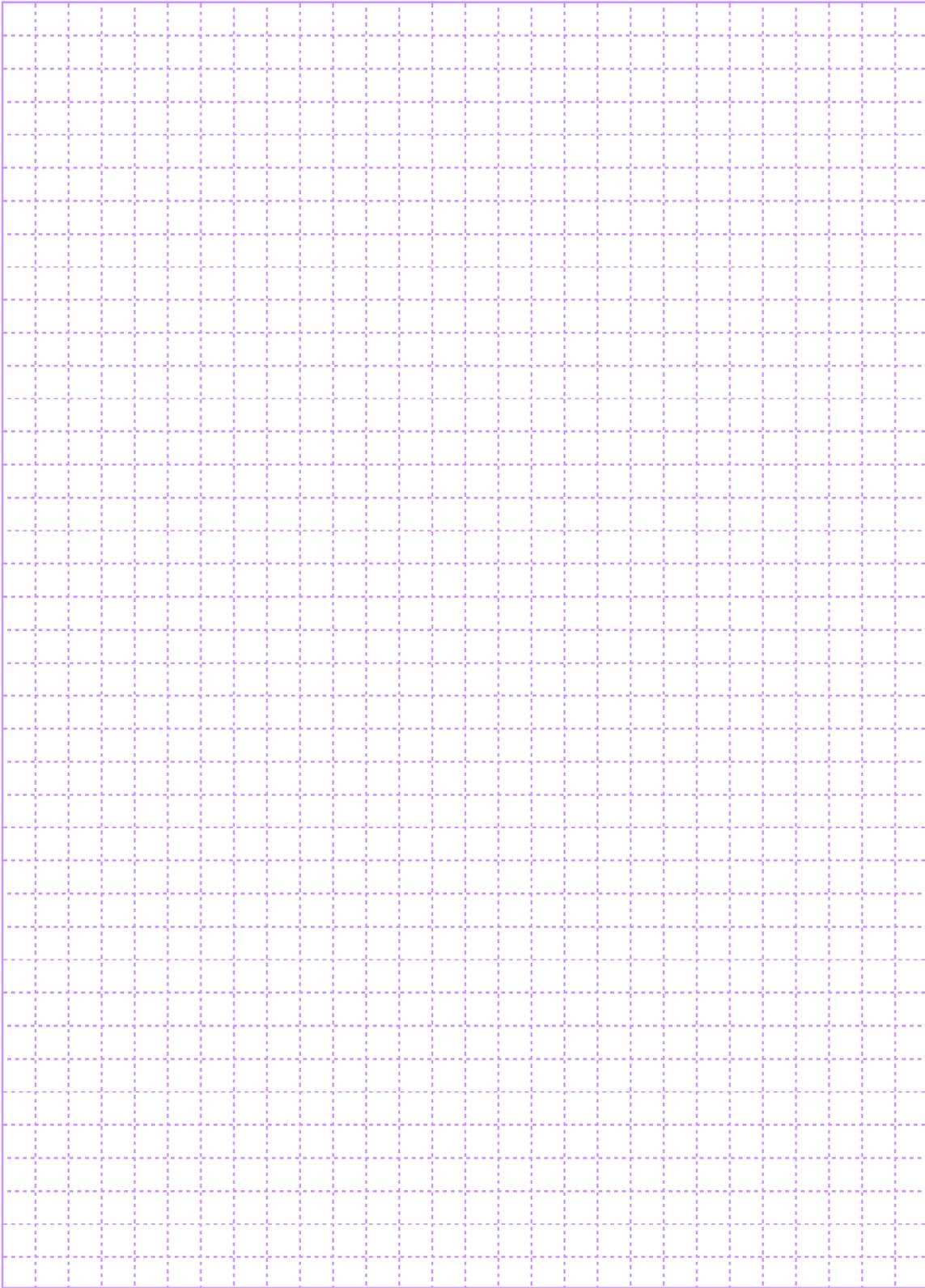
### QUESTIONS:

- 50% 1. Using the following list of seven factors (A-G) that would affect harvesting equipment selection listed below, discuss **any five (5)** of these factors as to how the factor being discussed might influence the attainment of each of the following management objectives (**if applicable**): safety, profitability, forest health, water quality, and other environmental concerns.
- A. Terrain Characteristics
  - B. Soil Characteristics
  - C. Timber Characteristics
  - D. Business Requirements
  - E. Weather and Climate
  - F. Silvicultural Requirements
  - G. Legislation, Regulations and THP Requirements
- 25% 2. For a skidder or tractor logging system, A) plot and label the correct general trend in the change in the cost of roads as road spacing increases, within the limits shown on the X-axis of the graph. B) Also, plot and label the correct general trend in the cost of skidding as road spacing increases, within the limits shown on the X-axis of the graph. On your graph, mark the most economical road spacing (ERS). C) Briefly explain how you determined the ERS. (**Use the blank piece of graph paper on the next page. Be sure to hand it in with your Applicant's Number filled-in.**)

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**Applicant No: \_\_\_\_\_, Graph for Question 2**



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10% 3A) On the next page of graph paper, Diagram a typical **shotgun skyline logging system with slack-pulling lateral-yarding capability (in profile view)**. For the logging system components listed below, clearly label the necessary components of this logging system on your diagram. (Use the blank piece of graph paper on the next page. Be sure to hand it in with your Applicant's Number filled-in.)

State, if any of these components are not necessary and the reason why:

- A. Skyline Cable
- B. Haulback Cable
- C. Mainline Cable
- D. Strawline Cable
- E. Carriage

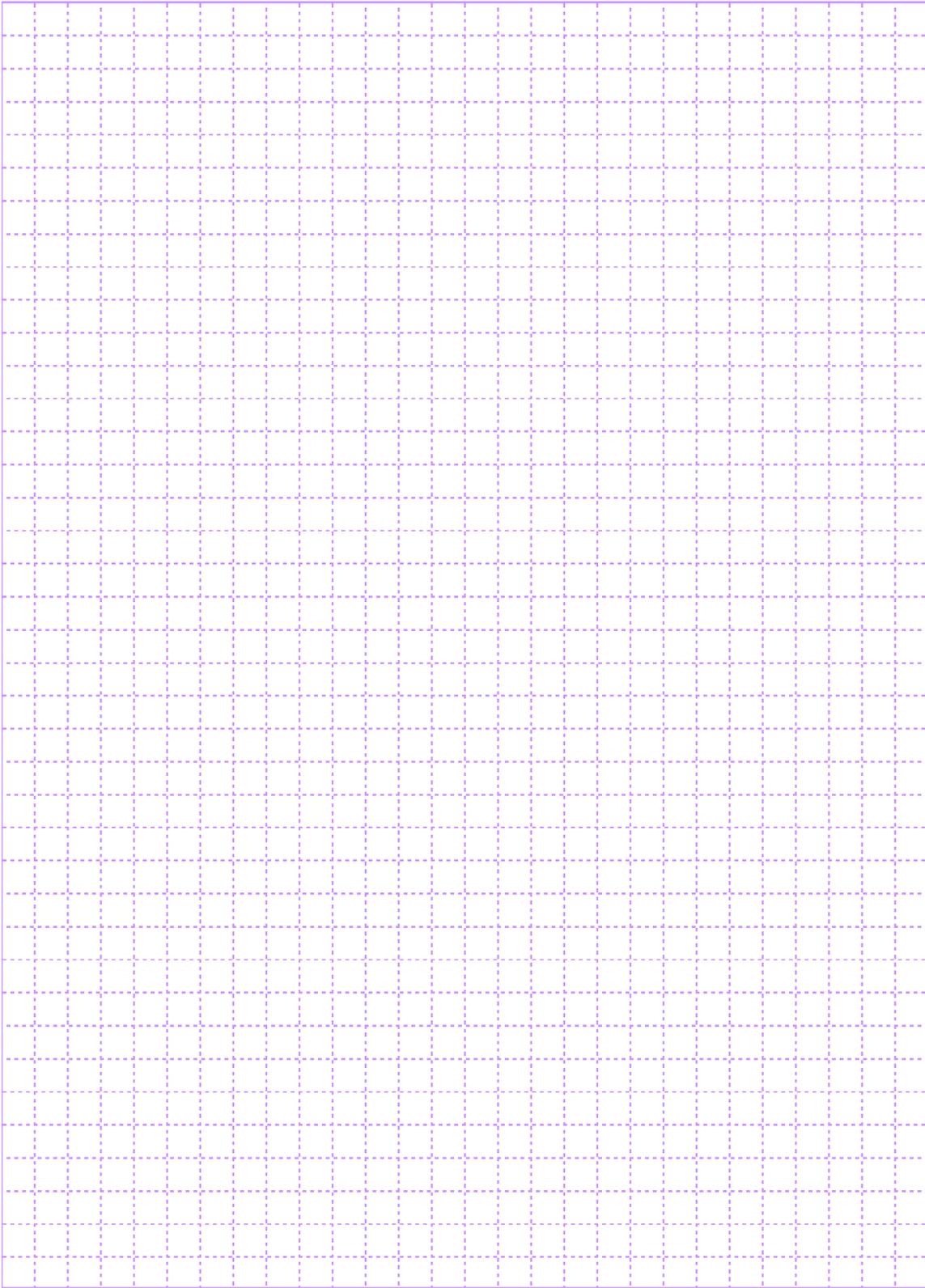
5% B) Briefly describe the topographic and equipment conditions necessary for the shotgun cable system to effectively operate.

10% C) Briefly describe how the carriage you are depicting derives its slack-pulling capability and how the carriage you are describing maintains its position during slack-pulling logs into the cableway. You may draw a diagram to aid your description, if you find that to be useful.

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**Applicant No: \_\_\_\_\_, Diagram for Question 3.**



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**This page is intentionally left blank. It may be used for additional space to answer Forest Engineering Question 3.**

**END OF QUESTION**

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## **QUESTION VII-SILVICULTURE**

### **OBJECTIVE**

To test your ability to develop a silvicultural prescription for a stand of your choice and to demonstrate your understanding of specific regulatory requirements providing maximum sustained production of high quality timber products (MSP).

### **QUESTION**

- 35%            1. List the essential elements of a silvicultural prescription.
- 65%            2. Consider a forest stand on private property with which you are familiar. In outline format, based on the elements listed above, describe in detail how you would develop a silvicultural prescription for the stand. Include the procedure you would use, the information you would obtain, the analysis and the recommendation you would make.

**END OF QUESTION**

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## **QUESTION VIII- FOREST ADMINISTRATION**

### **OBJECTIVE:**

To evaluate your understanding of forest administration requirements under California's Z'Berg-Nejedly Forest Practices Act.

### **SITUATION:**

The property is a 5,000-acre parcel in the Sierra Nevada Mountains at 5000-6000 feet elevation. It is a privately owned, forested property, with some of the ownership zoned as Timberland Production Zone (TPZ) and some not zoned as TPZ. The property already has a destination ski resort on it. The owner intends to expand the ski resort with two new long ski runs and an additional ski lift. An environmental study pursuant to the California Environmental Quality Act (CEQA) has been completed and the owner has been granted an approved county permit to expand his ski area, the Board of Supervisors having tentatively approved an immediate rezoning for use as a ski area.

The area is forested, but the timber in the project area is relatively small and volumes are low. Some trees are of commercial size approaching 20-24 inches in diameter. These are widely scattered. The project area is 32.5 acres and the volume of timber to be cut is approximately 30 MBF with additional unknown quantities of smaller than sawlog sized trees. The project area is on the portion of the ownership not zoned as TPZ, but it is definitely timberland.

To avoid further project review by the California Department of Forestry & Fire Protection (Cal Fire), and incurring the expense and delay of obtaining a Timber Harvesting Plan (THP) or other state harvesting permits, the owner intends to cut the trees in the ski run, pile them and burn most of them. Some will be chipped and spread over the graded ski run.

### **QUESTIONS:**

40% 1. Is the landowner correct in his presumption that avoidance of any commercial use of the timber removes the necessity for submission of a THP and Cal Fire review of this proposed operation? Explain your answer and cite substantiation for your reasoning, including but not limited to the California Forest Practice Rules, Z'Berg-Nejedly Forest Practice Act, and/or Public Resources Code.

30% 2. Would your answer change if the proposed clearing area was on some of the ownership zoned as TPZ? Explain your answer and cite substantiation for your reasoning, including but not limited to the California Forest Practice Rules, Z'Berg-Nejedly Forest Practice Act, and/or Public Resources Code.

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30% 3. If you feel that the landowner is not correct in his presumption, state the kind of permit(s) or authorization(s) that will be required from Cal Fire. Be explicit as to your reasoning for your answer and precise in the type of permit or authorization (if any) that will be required.

**END OF QUESTION**

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## **QUESTION IX- FOREST POLICY**

### **OBJECTIVE**

To determine the applicant's general understanding of timber and timberland taxation policy in California.

### **SITUATION**

As a RPF, you have been contacted by a newspaper journalist who is writing an article on State taxation of timber and timberlands in California. You want the story to be written accurately and attempt to answer her questions, while keeping the jargon and technicality to a minimum. Her questions are as follows:

### **QUESTIONS**

20% 1. Can you tell me how the State taxation of timber and timberland in California generally works? I would like to know the appropriate law (s) that governs this area. Please clearly define any terms, concepts, and acronyms that I should know.

20% 2. What was the public interest policy objective of the creation of this current method of State taxation of timber and timberland? Why not just tax it like a home or shopping mall? Which State agencies are involved in administering and collecting timber and timberland taxes?

15% 3. Can you briefly list for me three advantages that this method of timber and timberland taxation has for the owner and the general public?

15% 4. Are there any disadvantages to the owner and general public? I'd like to have a balanced view, so tell me three disadvantages if you can.

15% 5. Is there anyway for a forest landowner to get out of this method of taxation? Suppose he or she wants to build a subdivision on the land? Can he or she do it right away? Are there financial consequences?

15% 6. Can you briefly tell me how the Yield Tax liability on cut timber differs if the owner sells timber as cut logs which he delivers to the mill or if he makes a lump sum sale to the mill of the timber to be cut?

**END OF QUESTION**

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## QUESTION X- FOREST MANAGEMENT

### OBJECTIVE

To assess your ability to analyze the various factors impacting the effective management of the hardwood resource found within a conifer/broadleaf forest.

### SITUATION

You are retained by a client to prepare a forest resource management plan for a tract of land in a mixed conifer/broadleaf closed canopy forest.

- Location: San Bernardino County, California  
Size: 360 acres  
Type of timber: Mixed conifer/broadleaf closed canopy forest. **Conifer sub formation:** heavily stocked uneven age stand of white fir, incense cedar and Coulter pine with some scattered old growth white fir. Evidence of past harvesting activities from the early 1900's.. **Broadleaf sub formation:** uneven age stand of canyon live oak, California live oak, interior live oak and California black oak.  
Other vegetation: Approximately one-fourth of the property is a brush field, the result of a wildfire in the early 70's. Scattered oaks are beginning to dominate.  
Goals & Objectives: Client wants to improve the health of the forest, enhance the wildlife habitat, protect the forest from wildfire, insects and disease, maintain the visual appeal of the forest, and generate some income from forest product development.

### QUESTION

1. Your management plan has a specific **hardwood section**. In this section you want to cover the five elements listed below. For each of the elements, briefly answer the following questions:
  - A. What criteria and issues would you consider for each element?
  - B. What data will you need to collect in order to perform a thorough analysis?
  - C. What special limitations, constraints or benefits might you expect as a result of the property location in southern California?

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**ELEMENTS**

- 15% Growing Stock Inventory
  - 10% Forest Protection
  - 10% Wildlife Habitat
  - 10% Recreation and Aesthetic Considerations
  - 20% Forest Product Development and Market Analysis
- 35% 2. You have gathered the necessary information. Now list your management recommendations for each element for your client to use as a basis for hardwood management activities. State your assumptions.

**END OF QUESTION**

**END OF EXAMINATION**

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