

**Professional Foresters Registration Examination**

**October 6, 2006**

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

## QUESTION I - SHORT ANSWER

3% 1. Regional Water Quality Boards and the State Water Resources Control Board in California have the authority to require monitoring and reporting as a condition of any applicable waiver of waste discharge requirements on Timber Harvest Plans. What is the legislative basis for this authority?

3% 2. In the California Forest Practice Regulations, what is the minimum stand acreage for defining "late successional stands"?

4% 3. List four purposes a Timber Harvest Plan document serves during its life.

3% 4. The distance from a landing to the farthest point in the cutting unit is called the \_\_\_\_\_.

4% 5. Using forest economics as the sole criteria to determine when a project or transaction is economically feasible, what condition must be met?

4% 6. Currently, what is the status of the California's Forest Practice Rules as Best Management Practices under Section 208 of the Federal "Clean Water Act"?

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4% 7. For a Timber Harvest Plan, briefly describe the current procedure to obtain a spotted owl database check.

4% 8. Define the term frost heave.

3% 9. What are three primary factors required to adjust gross timber volumes to net timber volumes?

4% 10. Silviculturally, what is usually meant by an intolerant species? Include a common example of a tree species that is intolerant.

4% 11. A Timber Harvest Plan is reviewed by CDF first for acceptance for filing and reviewed again before approval. What is the basic standard for a Timber Harvest Plan to be accepted for filing?

3% 12. A scale or RF of 1:6,000 translates to how many feet on the ground per inch on a map?

3% 13. A deduction from taxable income, allowed under specific conditions, by U.S. tax laws to the owners of timber for reduction of an original growing stock through cutting is called \_\_\_\_\_.

6% 14. Define and differentiate between Current Annual Increment, Periodic Annual Increment and Mean Annual Increment.

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3% 15. Combustible materials that provides vertical continuity between vegetation strata and allows fire to climb into the crowns of trees or shrubs are commonly called \_\_\_\_\_

3% 16. The process whereby a tree or other vegetation loses vigor and may die when growing space is not sufficient to provide photosynthesis or moisture to support adequate growth is called \_\_\_\_\_.

3% 17. Of the following California legislative acts having to do with forestry which came last, in chronological order: Forest Taxation Reform Act, Z'berg-Nejedly Forest Practice Act, Registered Professional Foresters Act.

3% 18. What is the common name of a California native fern which may indicate wet conditions in a forested environment?

6% 19. The California Forest Practice Rules use Technical Addendums to convey certain procedures used to prepare Timber Harvest Plans. Briefly define 3 areas covered by Technical Addendums.

3% 20. In harvesting, a self-propelled machine, usually self-loading, that transports trees or logs by carrying them completely off the ground is called a \_\_\_\_\_

3% 21. The total assimilation of energy and nutrients by an organism or a plant community per unit of time is called \_\_\_\_\_ production.

3% 22. List three important social issues that are impediments to increased use of prescribed burning.

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3% 23. List 3 environmental or non-parasitic agents that may predispose trees to insect, mite and disease damage.

2% 24. Hydric (or hygric) is a term pertaining to a wet or moist climate. The term pertaining to an environment which is decidedly dry is \_\_\_\_\_ and the term pertaining to an environment with an intermediate supply of moisture is \_\_\_\_\_.

3% 25. Scribner Decimal C log scale differs from Scribner log scale in what way?

3% 26. Define the term "Forest Rent".

3% 27. According to the California Forest Practice Rules, the planned program of forest stand treatments during the life of a stand which consists of a number of integrated steps conducted in logical sequence leading to or maintaining a forest stand of distinctive form for the level of management intensity desired is called a \_\_\_\_\_.

4% 28. Briefly define a "blind lead or area" in logging terminology and state the obvious negative environmental result which can occur in that situation.

3% 29. The second largest membership of the Board of Forestry (BOF) is comprised of what category of members? How many members are from this group if the BOF has a full slate of appointees?

**END OF QUESTION**

## QUESTION II- FOREST MENSURATION

### OBJECTIVE

To determine your ability to perform certain mensurational tasks.

### SITUATION

As an RPF, the Small Tree Lumber Company hires you. You are directed to examine and report on a tract of timberland that will soon be available for purchase. The legal description of each parcels is shown below:

All of the Following are in T10N, R12E, AB & M

1. All of Section 15
2. All of Section 16
3. N  $\frac{1}{2}$  Section 22
4. NW  $\frac{1}{4}$  Section 14
5. S  $\frac{1}{2}$  S  $\frac{1}{2}$  Section 10
6. SE  $\frac{1}{4}$  SE  $\frac{1}{4}$  Section 22
7. S  $\frac{1}{2}$  S  $\frac{1}{2}$  SW  $\frac{1}{4}$  Section 21

### QUESTION

10% 1. Assuming the indicated legal description consists of sections with normal and standard sizes and shapes for the public land survey, plot the ownership on the plat provided on the last page of this exam. **Remove the plat from this question packet and RETURN AND INCLUDE with your answer packet. Be sure to fill in your Applicant No. on the Plat.**

2. Small Tree Lumber Company has requested that you conduct a 100% cruise on each of the parcels listed above that is 80 acres or less; a 20% line-plot cruise on each area that is greater than 80 acres but less than 1/2 section; and a 10% line-plot cruise on each parcel of 1/2 section or greater.

10% a. What is the number of sample plots required if your sampling unit is a 1/4 acre circular plot in:

- 1) Section 15?
- 2) Section 14?

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10% b. If your plots are on 2.5 chain spacing between plots, what is the spacing between lines of plots in:

- 1) Section 16?
- 2) Section 10?

3. You decide to localize the volume tables you will be using.

- 15% a. Briefly describe how a volume table is localized.
- 15% b. Discuss the advantages of this procedure.

4. Throughout the area there are openings of anywhere from 2 to 10 acres that support Christmas trees. You recognize that most of the property value is in the timber, but the Christmas tree potential could be another source of income, hence should be accounted for in your report.

5% a. What data would you tally while at the sample plots that will give you the necessary information for Christmas tree management?

5% b. Describe a rapid means of estimating average annual height growth for a Christmas trees species that you are familiar with. Be sure to specify the species that you are discussing.

5. On completion of fieldwork you develop the following gross sample volumes for section 14.

Pine	250 MBF
Fir	500 MBF
Total	750 MBF

15% a. Assuming that stand conditions are relatively uniform across the cruised area, what are the total gross volumes by species in Section 14?

15% b. Is it necessary to make any other calculation or adjustment to these volumes before using them to estimate timber value? If so, what are they and why are they made?

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Applicant No. \_\_\_\_\_ (Must Be Filled in)

**TYPICAL TOWNSHIP FOR A PUBLIC LAND SURVEY**


Applicant: The above diagram represents T10N, R12E, A B & M (Anywhere Base and Meridian System). You may tear out to answer the questions, but **THIS SHEET MUST BE TURNED IN WITH YOUR ANSWERS AND EXAM.**

**END OF QUESTION**

### QUESTION III- FOREST ECOLOGY

#### OBJECTIVE

To demonstrate knowledge of the role and effects of insects and diseases in forest stands.

#### QUESTION

40% 1. Discuss **four** major ecological roles/effects of insects in forest ecosystems. Give examples.

20% 2. *Annosus* root rot has become more widespread and abundant in partially cut stands in California. Describe how it spreads and mitigations for prevention and control.

20% 3. Name the most important disease of sugar pine and western white pine in California. Discuss the life cycle and dynamics of this disease including environmental and biological interactions. You may use a drawn chart or table to aid your discussion.

20% 4. Early logging practices in the mixed conifer forests of the Sierra Nevada mountain ranges were highly selective for pines and many entries were made over time. Discuss what effects this logging had on the complex of insects and disease-causing pathogens in these forests that is apparent today.

**END OF QUESTION**

## QUESTION IV-FOREST ECONOMICS

### OBJECTIVE

To evaluate your understanding of the relationship of value to specific variables under a particular management regime.

### SITUATION

Many contemporary resource management projects involve decisions regarding the harvest, retention or manipulation of forest vegetation. In making management recommendations it is important for an RPF to understand the relationship between value and resource elements.

### QUESTION

1. For any important commercial forest tree species grown in California:
  - 10% A. Draw a graph illustrating what you consider to be a typical relationship between STUMPAGE VALUE PER MBF LOG SCALE (vertical axis) and DIAMETER AT BREAST HEIGHT (horizontal axis).
  - 25% B. Discuss the dynamics of, and reasons for, what occurs along the curve you have drawn.
- 35% 2. The SHAPE of the curve (relationship between VALUE and DBH) will change over time with changes in forest product prices, logging costs, processing costs etc. Discuss IN DETAIL what forces might lead to substantial changes in the shape of the curve.
3. Financial Maturity
  - 15% A. Explain how the concept of financial maturity works when making decisions on the harvesting of EVEN-AGED timber stands.
  - 15% B. Explain which economic factors, other than financial maturity, would be important in a "real world" situation of a timberland owner deriving income by selling stumpage from a 10,000 acre tract. (Do not consider the case of an owner who processes his own timber.)

**END OF QUESTION**

## QUESTION V - FOREST PROTECTION

**OBJECTIVE:** To determine your ability to discriminate between the various critical fire behavior attributes of forest fuels and your ability to recognize the potential for various fuel combinations to drive wildfires.

**SITUATION:** One basic determinant of fire behavior is fuel. Fuel is the one determinant that the forester has the ability and, often, the obligation to manage.

### QUESTIONS:

Consider the following fuel characteristics:

- 25% 1. physical properties (size, bulk density, etc.)
- 25% 2. total fuel quantity (fuel loading)
- 25% 3. fuel moisture
- 25% 4. fuel arrangement and composition (you must give examples in particular vegetation-fuel types)

Discuss in detail EACH characteristic with respect to its effects on:

- A. Rate of fire spread,
- B. Resistance to control
- C. Spotting

**(END OF QUESTION)**

# **Professional Foresters Registration Examination**

**October 6, 2006**

## **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 your **analytical and planning** ability relating to road management and legacy logging road location in watercourse and lake protection zones.

### SITUATION

You are faced with the alternative of whether to reconstruct a one-half mile segment of an existing road or to construct a new road upslope outside of the watercourse protection zone. This road will provide access for a logging operation in the near future and also provide access for continued, future timber operations.

The climate is temperate and can have storms that exceed 4 inches of precipitation within a 24-hour period in a 5-year return period.

The existing road was built in 1981 as a single lane spur with a nearly constant grade of 3% with insloped drainage using an inside ditch and culverts for cross-drains. It was built just outside the boundary of the watercourse protection zone prescribed at the time of construction.

This road has been blocked for the last 15 years by three sediment plugged cross-drains and resulting washouts. There is an additional washout where a tributary Class II stream crosses the one-half mile segment. (A new road would also, obviously, cross the tributary Class II stream upslope.) The road surface has become vegetated with native grass, forbs, and brush and is in a generally stable condition.

Slopes adjacent to the existing road range from 20 to 35 percent and increase to 40 percent or more within 100 feet upslope from the existing road surface. Soils in the area are 30 to 50 inch deep unconsolidated, coarse, non-cohesive soils developed from weathered granitic parent material.

### QUESTIONS

- 30% 1. Discuss both the beneficial and detrimental aspects of each road alternative. Give at least 3 factors to be considered under both the good and the bad. Feel free to discuss additional aspects and solutions that you may need to consider in reaching a decision.
- 15% 2. Describe any site condition(s) requiring special care in design or mitigation.
- 25% 3. List and briefly describe five (5) measures that you would include in your plans to mitigate potential environmental problems. Indicate whether the mitigation applies to the new road, the use of the old road, or both.
- 30% 4. Identify and justify the road option you would select. State the assumptions that lead to a logical and defensible selection. (Economic justification alone is not adequate.)

END OF QUESTION

## QUESTION VII-SILVICULTURE

### OBJECTIVE

To determine your ability to recognize factors which influence the choice of silvicultural systems in forest management.

### SITUATION

Expressions of public concern regarding the aesthetic and environmental effects of clearcutting as a silvicultural practice in California have resulted in substantial pressure to use the selection or shelterwood systems as possible alternative silvicultural practices.

### QUESTION

- 20% 1. Present a brief and concise analysis comparing the clearcutting, shelterwood and selection (both individual tree and group) silvicultural systems in terms of removal, regeneration, resulting tree form and crown classes, and social values.
- 80% 2. Discuss the biological, environmental, social, and economic factors that would be important in determining which of the three silvicultural systems to use in a given situation. Support your answer with examples. **Note: responses for each of the factors (biological, environmental, social, and economic) are worth 20%.**

**END OF QUESTION**

## QUESTION VIII- FOREST ADMINISTRATION

**OBJECTIVE:** To determine your knowledge about evaluating forest programs requiring monitoring.

**SITUATION:** Tens of millions of dollars are invested annually by California forest landowners in habitat restoration-rehabilitation, both terrestrial and aquatic. Often the proposed work and manipulations are performed with little thought as to how the managers are going to document results or the lack of results. Well-designed monitoring must be an integral part of any restoration project. Monitoring is technically defined as systematically checking or scrutinizing something for the purpose of collecting specified categories of data. Besides monitoring types and methods, the appropriate scale both geographical and temporally must be considered.

Assume that you are in charge of an aquatic restoration effort for your ownership to establish sufficient large wood structure (LWS) and to improve salmonid habitat and function. Answer the following questions:

### QUESTIONS:

1. Using the assumed project given above, For each of the monitoring types listed below,
  - 30% A) Give a brief, but correct definition for each type of monitoring or the key questions(s) you are trying to answer with this type of monitoring, and
  - 30% B) Give an example of what might be monitored in this project for each type of monitoring.

**I. Baseline Monitoring:**

**II. Status Monitoring:**

**III. Trend Monitoring:**

**IV. Implementation/Compliance Monitoring:**

**V. Effectiveness Monitoring**

**VI. Validation Monitoring:**

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20% 2. Discuss four restoration-rehabilitation benefits that you are assuming will be obtained with the placement of the large wood structure into the selected stream locations. Limit yourself to direct benefits to salmonids, even though there may be benefits to other biota.

20% 3. Assuming that the addition of large wood structure is needed in the stream locations selected, discuss how past forest and fisheries management have lead to this deficit in California (and other western states).

**END OF QUESTION**

## 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, without resorting to too much jargon, which follow:

### 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/or the general public?

15% 4. Are there any disadvantages to the owner and/or 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 would 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**

## QUESTION X-FOREST MANAGEMENT

### OBJECTIVE

To determine your understanding of the relationship between generally accepted forest management practices and the maintenance of forest structure and composition at various scales for wildlife diversity.

### QUESTION

- 40% 1. Discuss why the size and spatial arrangement of late succession stage forests (and stands) is believed to be critical for maintenance of species dependent upon that habitat. Include in your discussion how landscape design techniques or harvest unit layouts can provide mitigation for wildlife inhabiting late succession stage forests.
- 40% 2. Discuss three elements of structure and composition of late succession stage coniferous forests. Include the benefits to wildlife and how these elements might be favored when designing harvest units.
- 20% 3. Briefly describe the positive and negative effect of an increase in ecotonal acreage across a forested landscape on plant and animal species richness.

**END OF QUESTION**

**END OF EXAMINATION**