

Professional Foresters Registration Examination

OCTOBER 21, 2011

PART I

Instructions: APPLICANTS, PLEASE READ THESE INSTRUCTIONS CAREFULLY. You MAY complete PART I by doing ONE of the following two options:

A) Complete the Short Answer Section (Question 1) and Any Two (2) of the Essay Questions (Questions II through V)

OR

B) Complete Any Three of the Essay Questions (Questions II through V) and OMIT answering the Short Answer Question (Question I).

Question I - Short Answer
Question II - Forest Mensuration
Question III - Forest Ecology
Question IV - Silviculture
Question V - Forest Protection

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

Answer on these pages, tear from the booklet and submit with the answer packet if you chose Option A for Part I of this examination.

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.**

<u>Acronym or Abbreviation</u>	<u>Full Text</u>
BOF	California State Board of Forestry and Fire Protection
CCR	California Code of Regulations
CDFFP	California Dept. of Forestry and Fire Protection
CDF&G	California Department of Fish and Game
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

Answer on these pages, tear from the booklet and submit with the answer packet if you chose Option A for Part I of this examination.

QUESTION I - SHORT ANSWERS

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. (1 point per correct answer) ? _____

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

3% 6. As applied to the growth of an even-aged stand of trees, what is the term for the point where the volumetric MAI is equal to the volumetric PAI?

3% 7. Besides CO₂, list 3 other **predominantly, naturally occurring** greenhouse gases that can be found in earth’s atmosphere.

3% 8. What California law requires forest practice regulations to address archeological resources? _____

CONTINUED NEXT PAGE

Answer on these pages, tear from the booklet and submit with the answer packet if you chose Option A for Part I of this examination.

3% 9. A written analysis of pre-harvest and post-harvest timber stand conditions and a description of the silvicultural practices and systems to be used in lieu of the standard methods in a Timber Harvest Plan (THP) is termed a

3% 10. Purposefully leaving a logging road reasonably impassable to standard production four wheel-drive highway vehicles, and leaving a logging road and landings, in a condition that provides for long-term functioning of erosion controls with little or no continuing maintenance is termed _____, under the FPRs.

3% 11. List 3 preventive practices to control forest insects, mites and diseases.

3% 12. Of the following California legislative acts involving forestry, which one came first, in chronological order (date of passage): Z'berg-Nejedly Forest Practice Act, Forest Taxation Reform Act, Registered Professional Foresters Act? **Circle the legislative act that is your answer.**

3% 13. For tax purposes, logging equipment is usually depreciated and roads are amortized. By what taxation process is the cost of timber recovered by the forest enterprise? _____

3% 14. The Scribner Dec. C log rule differs from the International ¼" Rule in what basic way? _____

3% 15. The Forest Practice Rules allow the Review Team how many days to examine a THP so as to assist the Director in determining if the plan is acceptable for filing as submitted? _____

CONTINUED NEXT PAGE

Answer on these pages, tear from the booklet and submit with the answer packet if you chose Option A for Part I of this examination.

4% 16. List FOUR of the *genera Fagaceae* found in North America.

3% 17. The process by which a landscape is broken into small islands of forest within a mosaic of other forms of land use or ownership is known as

4% 18. An agreement between the U.S. Secretary of the Interior and either a private entity or a State, specifying the conservation measures that will be implemented in exchange for a permit that would allow the taking of a threatened or endangered species is called a

4% 19. According to the CDFFP guidance concerning large old trees, what is the smallest stand size area that must be disclosed in a THP when large old trees are present and of potential significant adverse impacts pertaining to large old trees may occur? _____

3% 20. On a cable logging system, explain the purpose of the haulback line.

3% 21. 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:

3% 22. A 25-ton load of fresh wood chips is delivered to a biomass co-generation facility. The load of chips has moisture content of 45%. How many dry weight tons in the load of chips? _____

CONTINUED NEXT PAGE

Answer on these pages, tear from the booklet and submit with the answer packet if you chose Option A for Part I of this examination.

3% 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 THP fieldwork? _____

4% 24. Certification of forestlands to attest that the management of such lands meets approved standards of a designated authority is common today. Give the complete name of two main certification programs being used in the United States in 2011.

3% 25. A cost that changes in response to the level of output is what type of cost?

3% 26. 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% 27. According to the 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

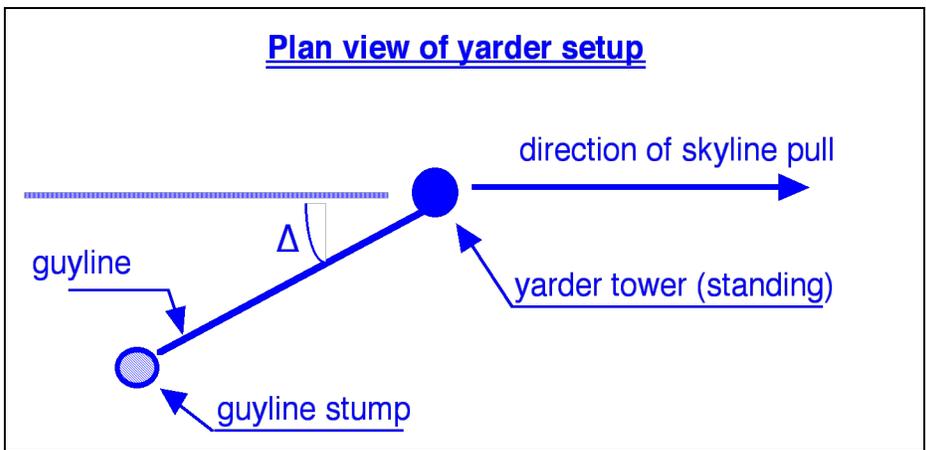
3% 28. In California, name the three Cadastral Survey Base and Meridian Systems used to facilitate and organize the Public Land Survey System in the State.

3% 29. For northern California, list three salmonids that have been placed on the Federally Threatened or Endangered list. Give **either** the common **or** scientific names. (Northern California is commonly defined as that geographic region north of the Tehachapi Mountains.)

CONTINUED NEXT PAGE

Answer on these pages, tear from the booklet and submit with the answer packet if you chose Option A for Part I of this examination.

- 2% 30. An eight-digit code (e.g.17040206) that uniquely identifies any of the drainage basins in the United States in a nested arrangement from largest (Regions) to smallest (Cataloging Units) is called a _____.
- 3% 31. In the diagram below, the angle Δ represents the horizontal angle a rear yarder guyline deviates from the skyline's axis of pull. (Assume other guylines are in place but are not shown.) This angle should never exceed how many degrees to avoid overstressing the guyline during yarding? _____



- 3% 32. List three (3) environmental or topographic settings that are common locations of prehistoric archeological resources found on California timberlands.
- _____
- _____
- _____

END OF QUESTION

QUESTION II - FOREST MENSURATION

OBJECTIVE:

To determine your ability to perform certain mensurational tasks.

SITUATION:

As an RPF, the Big Tree Land and Timber 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 parcel is shown below:

All of the Following are in T10N, R12E, Anywhere B & 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 that the indicated legal descriptions 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. Also state what is the total acreage in the tract of land to be examined? **Remove the plat from this question packet and RETURN AND INCLUDE with your answer packet. Be sure to fill in your Applicant Number 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?

CONTINUED ON NEXT PAGE

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?

CONTINUED ON NEXT PAGE

Applicant No. _____ **(Must Be Filled in)**
TYPICAL TOWNSHIP FOR A PUBLIC LAND SURVEY

What is the total acreage in the tract that you will be examining? _____

Applicant: The above diagram represents T10N, R12E, Anywhere B & M. You may tear out this page to answer the questions, but this sheet **MUST** be turned in with your answers and exam.

END OF QUESTION

QUESTION III-FOREST ECOLOGY

OBJECTIVE:

Fisheries considerations have been at the forefront of Forest Practice Regulations in California since 1997 after the Federal Endangered Species Act listing of coho in 1996. An understanding of 1) stream and riparian habitat, 2) salmonid and other fish requirements and 3) the inter-relationships between these items has become an important part of a forester's knowledge base. The following questions are intended to determine your understanding of stream habitat and salmonids.

QUESTIONS:

- 25% 1. Many of the functional and structural attributes of stream habitat are created and maintained through interaction with riparian vegetation. Riparian areas constitute the interface between terrestrial and aquatic ecosystems, performing a number of functions that affect the quality of salmonid habitat. List the FIVE MOST IMPORTANT ways riparian areas influence streams and consequently salmonid habitat. For each way you have listed, briefly explain how the stream habitat is influenced to the benefit of salmonids.
2. Pool to riffle ratios are one parameter which defines a stream's ability to support fish, especially salmonids.
- 5% A) Explain what is meant by pool to riffle ratio and how it is measured.
- 20% B) Define a favorable range of pool to riffle ratio for a stream that is a Class I stream with salmonids using it and explain why you think that your specified pool to riffle ratio (or range of values) is favorable to salmonids.
3. The National Marine Fisheries Service (NMFS) in its "1997 Aquatic Properly Functioning Condition Matrix" uses two definitions in describing salmonid ecosystems: "properly functioning conditions" and "fully functioning conditions".
- 15% A) What is the difference between the two terms?
- 10% B) Describe one problem in implementing the NMFS concept.
- 25% 4. Large Woody Debris (LWD) has been determined to be very important for salmonid habitat. List and briefly describe five effects of insufficient or reduced LWD in a stream.

END OF QUESTION

QUESTION IV-SILVICULTURE

OBJECTIVE

To determine your ability to recognize factors that 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.
2. Discuss the following factors that would be important in determining which of the three silvicultural systems to use in a given situation. Support your answer with examples.
- 20% A) Biological,
20% B) Environmental
20% C) Social, and
20% D) Economic

END OF QUESTION

QUESTION V- FOREST PROTECTION

OBJECTIVE

To determine your ability to assess forest health and to demonstrate knowledge of management alternatives available to California RPFs.

QUESTION

- 30% 1. The definition of “dying” trees includes those trees “judged to be dead within one year by an RPF”. Briefly describe what methods are available to judge mortality, and briefly describe 6 features you would look for when trying to judge if a conifer will be dead within one year.
- 10% 2. How do hardwoods differ from conifers when trying to judge probability of mortality? What are some similarities?
- 40% 3. Name 8 possible “agents” that are NOT biological in nature which cause damage to conifers. Briefly describe one or more sources of the agent, type(s) of damage from each agent, and how serious the damage is likely to be (chance tree would die or recover, lasting effects.) See Example below.

Example:

Agent - cold temperatures (freezing)

Source(s) of agent - natural cold air drainage, temperature inversion, weather patterns (arctic air mass)

Type of damage - freezing and killing of new growth, older needles can be killed too, frost cracking, frost heaving of seedlings

Seriousness - a mature tree would usually survive, seedling that have been pushed out of the ground would generally die if much of the root is exposed.

Reduction in growth corresponding to a reduction in foliage. Reduction in wood quality possible from frost cracks. Top kill can deform tree.

Confine the answers to the direct types of damage; do not take analysis out to secondary insect or pathogen attacks. However, do consider trees of different ages (seedlings to mature) and of different species in your responses.

- 20% 4. Briefly describe two actions that can be taken under the Forest Practice Rules that will generally allow for the harvesting of dead and dying trees to begin within two weeks of submission of paperwork. Include what RPF responsibilities exist, if any, in implementing these actions.

END OF QUESTION

Professional Foresters Registration Examination

OCTOBER 21, 2011

PART II

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

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

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

QUESTION VI-FOREST ENGINEERING

OBJECTIVE:

To assess your understanding of GPS technology and ability to utilize it in forestry work.

QUESTIONS:

- 10% 1. What does the acronym GPS stand for, what US government agency owns and manages the system?
- 25 % 2. To determine a terrestrial three-dimensional position (3-D), how many satellites, at a minimum, must your GPS receiver reliably receive a signal from? Explain how the GPS receiver accomplishes this task and why the number of satellites you have specified above is necessary.
- 25% 3. Describe the process known as “Differentially Corrected GPS” (DGPS) and its affect on GPS positional data and results. Include in your description a discussion of real-time DGPS and post-survey DGPS.
- 25% 4. You wish to use a GPS unit to map a stand of timber. Describe the “type” of GPS unit you would need in terms of its capabilities, cost, and features. Be specific in your discussion.
- 15% 5. Discuss three common problems that you may encounter in using GPS to map a timber stand under forest conditions found in California. For each problem you give, also include at least one technique (procedure, equipment use or additional equipment) that has a good chance of defeating or overcoming the problem.

END OF QUESTION

QUESTION VII-FOREST ECONOMICS

OBJECTIVE

To determine your understanding of basic forest economics principles and how forest practice regulations may affect a property's value.

SCENARIO:

Imagine that a proposal has been made for a California state regulation that would limit the harvesting of privately-owned late seral/old growth stands to 10 percent of their volume per decade. You have been asked to estimate the financial change (gain or loss) to a particular private owner in present value terms (before income taxes) if this proposal was to become law.

QUESTIONS

- 25% 1. **Describe** the general method of analysis that you would use to determine the potential financial change to a forest owner of such a stand.
- 25% 2. **List** and briefly describe the types of data that you would need to make your evaluation.
- 25% 3. **Describe** how, in your financial calculation, you would handle risk,
- 25% 4. **List** the major steps that you would follow to perform the analysis.

END OF QUESTION

QUESTION VIII- FOREST ADMINISTRATION

OBJECTIVE

To determine your knowledge of governmental entities which have a major impact on the application of forest administration in California.

QUESTION

- 15 % 1. List five (5) governmental agencies, Boards or commissions that have authority to influence or directly affect forest administration on forest lands in California. For each entity identify its level in the hierarchy of government and its general jurisdiction (i.e. Federal, state, local, private, tribal land, etc.) in California.
- 45% 2. Choose three (3) of the entities, each in a different general jurisdiction, that you listed in part 1. Name and describe two fundamental laws guiding each entity in its policy development or implementation. DO NOT USE THE SAME ENTITY OR LAW MORE THAN ONCE.
- 40% 3. Choose four (4) of the following subjects:
- a. Protection
 - b. Regulation
 - c. Incentives
 - d. Taxation and revenue
 - e. Research

For each subject you have chosen name two governmental entities that interact in the development or implementation of forest policy, practices, and/or administration regarding that subject, and briefly discuss how that interaction takes place.

END OF QUESTION

QUESTION IX- FOREST POLICY

OBJECTIVE:

To determine your 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, shown below, without using too much Forester's jargon:

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 govern this area. Please clearly define any terms, concepts, and acronyms that you think 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 get involved in administering and collecting the taxes from this taxation scheme?
- 15% 3. Can you briefly explain to me three advantages that this method of 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 landowner to get out of this method of taxation? Suppose he or she wants to build a subdivision on the land? Can he do it right away? Are there financial consequences?
- 15% 6. Can you briefly tell me how would the Tax liability on cut timber differ 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