Professional Foresters Registration Examination

APRIL 16, 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

Applicant #:_____
Question # __I_____

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

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.**

Acronym or Abbreviation	Full Text
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

3% 1. 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% 2**.** 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% 3. The quantity of forage required by one mature cow and her calf (or the equivalent, in sheep or horses, for instance) for one month is termed a _____.

3% 4. There are multiple permit options available for fuel hazard reduction on private and state-owned lands. Under the "La Malfa" **Forest Fire Prevention Exemption** (CCR 1038(i)), what is the acreage limit that may be treated? _____.

3% 5. A plant that is more or less restricted to moist sites, but not considered an aquatic plant is termed a _____.

3% 6. According to the definition in FPR 895.1, define the two conditions required in the abandonment of a forest road. _____

_____

_____

_____

_____

3% **7.** 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?

_____

_____

_____

_____

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3% 8. In a forest stand, the trees that form the general level of the forest canopy and receive full light from above, but comparatively little from the sides are silviculturally classed as

_____

3% 9. What was the most common cause for the lack of Large Woody Debris (LWD) in coastal streams in California?

_____
_____
_____
_____

3% 10. A cost that changes in response to the level of output is what type of cost?

_____

4% 11. A THP map has a scale of 1 inch= 200 ft and has 25 ft contour intervals. A proposed temporary road for a logging unit extends 4.5 inches from one permanent road to the intersection with another permanent road. The proposed temporary road starts on a contour line, crosses four other contour lines and ends, at the landing, on a fifth contour line. What is the grade of this proposed temporary road (round to the nearest percent)?_____

3% 12. Why does the concept of MAI not apply well to uneven- age stands?

_____
_____
_____
_____

3% 13. According to the FPRs, an approach to harvesting based on the retention of structural elements or biological legacies (trees, snags, logs, etc.) from the pre-harvest stand for integration into the post-harvest stand to achieve various ecological, social and geomorphic objectives is called

_____.

3% 14**.** The largest membership class on the Board of Forestry is comprised of what category of members? How many members are from this group if the BOF has a full slate of appointees?_____

3% 15. A nonmonetary and rarely calculable toll on society arising from any form of economic activity is termed a_____

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3% 16. The Forest Practice Rules and regulations define "functional wildlife habitat" as having three basic features. List these three features
_____, _____,
_____.

3% 17. According to the CA. Forest Practice Regulations, under what conditions is an on-site meeting between the responsible RPF, preparing a THP (or supervised designee) and the LTO (or supervised designee) required? Also, specify the time interval when this meeting must occur.
_____
_____

3% 18. 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 (Not an acronym or abbreviation) of the two main certification programs being used in the United States in 2009.
_____
_____

4% 19. Describe the difference between litter and humus.
_____
_____
_____
_____

3% 20. In performing a Stocking Survey for a clearcut area, you lay out a uniform grid as prescribed and sample 80 plots. What would be the minimum number of stocked plots needed to find the area in a stocked status, according to the FPA?
_____
_____
_____
_____

3% 21. Failing to show **known** areas of landslides and unstable soils on THPs, could lead to a RPF being charged with which disciplinary offense under the Foresters' Licensing Law?
_____
_____
_____
_____

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3% 22. Explain how stream "ordering" works in a large watershed (it is a system that compares streams within and among watersheds, e.g.-Strahler System).

_____
_____

3% 23. A logging cost that remains constant regardless of the level of logging output is what type of cost? Give a typical example of this type of logging cost.

_____
_____

3% 24. In logging terminology, define the term dead-man. _____

_____
_____
_____
_____

3% 25. . According to the general definition in FPR 895.1, the Winter Period is defined as occurring between which dates? _____

3% 26. What is the "coefficient of variation" used to measure?

_____
_____
_____
_____

4% 27. List any four of the seven characteristics used to determine erosion hazard ratings under the FPRs.

_____
_____
_____
_____

3% 28. What condition must be met to use a local, simple Tarif Table to determine the volume of trees in a Ponderosa pine stand?

_____
_____
_____
_____

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3% 29. In a THP, what does the term "Appurtenant" roads mean?

_____
_____
_____
_____

4% 30. In terms of water quality law, define the term TMDL and from what law (s) does it derive?

_____
_____
_____
_____

3% 31. In economic terms, the actual quantity of a commodity or service that buyers are willing to purchase in the market at a given price over a specified time period is called

_____

3% 32. What is the difference between a stand's arithmetic mean diameter and its quadratic mean diameter?

_____
_____
_____
_____

END OF QUESTION

QUESTION II - FOREST MENSURATION

OBJECTIVE

To determine your understanding of various methods of predicting forest growth.

SITUATION

Your employer has requested your advice about obtaining forest growth information necessary for preparing a timber management plan. She is interested in putting the entire block under management for long-term productivity.

Her property is a fairly solid block of 10,000 acres of mixed conifer timber of medium or better site. Most of the property contains timber of average uniformity, all-aged, medium stocking and with a good distribution of age classes. Some areas, however, contain even-aged stands of young saw-timber. The block is adjacent to somewhat similar properties that have been managed for sustained yield for 20 years or more. The landowner is concerned about the cost of the project but is willing to spend enough money and allow enough time to get the necessary information.

QUESTION

Briefly **describe** each of the traditional methods of obtaining growth data listed below and **discuss the appropriateness and limitations** of each to meet the landowner's stated objective for the previously described forest condition:

5% 1. General Observation

20% 2. Even-aged Yield Tables

25% 3. Stand Table Projection

25% 4. Permanent Growth Plots or Continuous Forest Inventory

25% 5. Computer Software Simulation Growth Models

END OF QUESTION

QUESTION III-FOREST ECOLOGY

OBJECTIVE:
To demonstrate your understanding of the effects fire has on various aspects of the forest ecosystem.

SITUATION:
California's forests and wildland vegetation have developed in close association with fire. Fire is also an important ecosystem component and tool for forest managers.

QUESTIONS:

1. What has been the impact of fire suppression on mixed conifer forests in the last 100 years (assume no stand replacing wildfire or other stand management activities), such as those found in the Sierra Nevada Mountains of California with regard to:

   5% A. Change in conifer species composition

   5% B. Dead fuel loading trend and prognosis over the rotation of a managed stand

   5% C. Within stand diversity of vascular plants

   5% D. Wildlife diversity

2. Briefly describe **three** fire adaptations for each of the five following species as found in the Sierra Nevada Mountains. If you believe any of the five species listed does **NOT** have at least three fire adaptations, state this affirmatively rather than simply describing less than three.

   3% A. ponderosa pine

   3% B. sierra redwood (giant sequoia)

   3% C. white fir

   (% D. knobcone pine

   3% E. green leaf manzanita

CONTINUED ON NEXT PAGE

3. **Discuss** what ecological impacts are associated with **spring** burning vs. **fall** burning, in California, on the following biological or environmental elements of the ecosystem.

5% A. Plant buds

5% B. Shrub damage and mortality

5% C. Tree root systems

5% D. Air quality:

5% E. Wildlife

4. Some ecosystems experience soil water repellency (hydrophobicity) problems following fire:

15% A. Describe the physics involved in creating hydrophobicity and what generalized soil texture group is most prone to this problem. Using your physics discussion, explain why this soil texture group is most affected.

10% B. Describe what fire and fuel conditions are most likely to cause a water-repellant zone in soils.

15% C. Compare and contrast the possible burning conditions and subsequent risk of formation of a hydrophobic layer in the burning of a chaparral ecosystem compared to a mixed-conifer ecosystem.

END OF QUESTION

QUESTION IV-FOREST ECONOMICS

OBJECTIVE

This question is to assess your ability to use economic analysis to determine an optimal allocation of reforestation funds.

SITUATION

Assume you are in charge of the reforestation program for a private landowner with approximately 100,000 acres of generally unstocked or under stocked forestland. (The need for restocking is not a result of harvesting activity.) Not all acres require restocking, but individual areas in need of regeneration vary widely in site quality, location, climatic conditions, and presence of competing vegetation. You are given a budget of $1 million with instructions to allocate it over the next five years in the most financially appropriate manner among various reforestation opportunities (reforestation projects) that are available to you.

QUESTION

45% 1. Using **generally accepted** economic principles, BRIEFLY describe three economic criteria/methodologies you might use for judging the **financial appropriateness** of a single reforestation opportunity. Be certain to state any assumptions.

30% 2. Explain briefly the type of information you would need for assessing or using these criteria/methodologies.

25% 3. Develop and justify **ONE** method for allocating your total budget among the alternative opportunities, as required by your employer.

END OF QUESTION

QUESTION V- FOREST PROTECTION

OBJECTIVE

To ascertain your ability to identify and assess factors relevant to archeological review and protection of archeological resources.

SITUATION

A THP has been proposed on private property in California under the most current FPRs.

QUESTIONS

30% 1. You are the forester responsible for the project. Identify and discuss the archaeological background information you will need to obtain to comply with present forest practice rules and regulations and to carry out an efficient site discovery phase of the archeological review.

20% 2. Assume that you are ready to implement an archaeological survey of the project area, two survey procedures must be followed and addressed in your survey report; the **SURVEY METHOD** and the **SURVEY INTENSITY**. Describe and explain these important survey procedures. Give examples.

20% 3. During your field survey, a cultural site is found that must be addressed. In order to determine what mitigation measures might be necessary and to what degree the project may have an adverse effect, the California Environmental Quality Act and forest practice rules usually require that significance of the site be considered and addressed. Describe and discuss five elements of significance.

30% 4. Once significance has been considered and the project's site specific objectives evaluated, describe and explain **enforceable protection measures** both within the site and within 100 feet of the site boundaries.

END OF QUESTION

Professional Foresters Registration Examination

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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 test the applicant's ability to perform basic elements of mapping, designing a logging road to fit physical, economic and environmental requirements.

SITUATION:

You have accepted a job to provide a forest landowner with a preliminary plan for harvest access within the timbered property he has just acquired. The first report from you should consider the following requirements and goals:

A. Provide a map showing property lines.
B. Outline a feasible road plan which is located on the owner's property, and which considers the owner's goals and constraints.
C. Avoid substantial damage to wet areas, springs and streams by minimizing construction and crossings of these areas.
D. Assume that the land use will be for timber production and the land is zoned TPZ.
E. The most likely direction of future timber hauling will be to the west.

QUESTIONS:

(NOTE: TWO COPIES OF THE MAP ARE ON PAGES **16 AND 17** OF THIS EXAM. YOU MAY USE ONE COPY FOR A SPARE IN CASE YOU WISH TO REVISE YOUR ANSWER. **YOU NEED ONLY HAND IN ONE MAP**. BE SURE TO SUBMIT THE MAP WITH YOUR ANSWER. BE SURE TO PLACE YOUR APPLICANT'S NUMBER IN THE SPACE PROVIDED ON THE MAP.)

10% 1. On the attached map, draw property lines, as close as possible on the map provided, based on the following description from the Grant Deed (Note- The page behind the map has a ruler for your use in the problem, if needed. Also, note that the center of Sec. 34 is marked by the number "34" in the lower left quadrant of the map.):

Section 34: The West Half of the Northeast Quarter; and, The Southwest Quarter of the Northeast Quarter of the Northeast Quarter; and The North Half of the Northwest Quarter of the Southeast Quarter.

CONTINUED NEXT PAGE

15% 2. Assume a perfect, square land survey grid of the area. State the anticipated acreage of each described sub-parcel (see Question 1) and the total acreage of the property.

15% 3. Within the subject ownership being considered in this Question, identify and draw a line around each wet area or spring shown on the map (assume the standard USGS mapping symbol for a wet area or spring). At the property line, indicate each Class II stream by placing a "V" across the stream symbol, with the vertex of the "V" pointed in the direction of water flow.

15% 4. Using the map legend information and the map provided, compute the following topographic quantities:

A. 5% grade is _____ feet elevation change per map inch.

B. If you were to plot a road segment on the map that started on one contour line and ended on the next and was 0.75" long, what is the grade represented by that segment?_____.

C. Assume that tractor skidding is limited to 35% slope. If your proposed harvesting area contains 4 consecutive contour lines in 1-inch can you use the tractors? State your reasoning with supporting computations.

45% 5. Plan a road system for the **entire ownership**, and sketch it on the map using the symbols on the map legend.

For road segments, designate potential landings appropriate to serve the logging systems to be used. Show road location to the nearest half-contour AND indicate on the map the direction of loaded haul for logging trucks (You may use any symbol or designation method, such as arrows. Just be sure to make it clear to the grader which way is the direction of loaded haul). For all Class II stream-crossing show locations on map with the designated symbol.

CONTINUED NEXT PAGE

In an appropriate and clear manner designate which areas are to be cable and tractor-yarding areas. Use the **T**or **C** legend symbols provided on the map legend. If no appropriate symbol is provided, you may construct one and add it to the legend. You are subject to limitations stated in the SITUATION description and the following additional constraints:

A. "Old Road" cannot be used for landings or skidding upon as it is a county road with pavement. Only construction for new encroachment is permissible. No right-of ways have been obtained, hence all new roads must remain within the ownership.

B. Favorable truck road grades may be as steep as 15%. Adverse truck road grades may be as steep as 10%.

C. Tractor yarding may be conducted on slopes as steep as 35%, minimum area of 5 acres. Downhill tractor yarding is preferred, maximum (external skidding) distance to landings is 1,000 feet; uphill tractor yarding is limited to a maximum of 200 feet.

D. Cable yarding must be conducted on slopes greater than 35%, minimum area of 5 acres. Cable yarding must be uphill, maximum (external yarding) distance from landings is 800 feet, and away from streams, if possible.

END OF QUESTION

Hold for Map Copy 1

Colored Paper

Hold for Map Copy 2

Colored Paper

Hold for ruler

QUESTION VII-SILVICULTURE

OBJECTIVE

To determine your understanding of ecological tradeoffs present when making silvicultural management decisions.

SITUATION

California black oak (*Quercus kelloggii*) is common to a wide portion of California and southeastern and central Oregon. California black oak *(Quercus kelloggii.)* exceeds all other California oaks in volume, distribution, and altitudinal range. California black oak is a component of six forest cover types. Yet this deciduous hardwood has had little sustained commercial use and almost no management. In some parts of the Sierra Nevada it was common practice to fall all California black oak as part of commercial forest practices.

QUESTIONS:

15% 1. Briefly describe 5 identification characteristics of California black oak that would positively distinguish it from other *Quercus* species.

45% 2. Discuss the significance of California black oak as a component of the mixed conifer forest ecosystem. Include both positive (25 % points) and negative significance (20 % points) of attempts to eradicate California black oak in regenerated areas.

40% 3. Describe why sprouting appears to be the dominant source of most black oak regeneration and its affect on the resulting stand. Discuss how this affects black oak control when it is desirable to reduce the California black oak component in a stand (thinning, sanitation removal for mistletoe, etc.), Discuss five effective control methods that are available?

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:

CONTINUED NEXT PAGE

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 led to this deficit in California (and other western states).

END OF QUESTION

QUESTION IX- FOREST POLICY

OBJECTIVE

To determine your knowledge regarding options available through California state law and regulation to meet planning and environmental requirements for commercial forest management.

QUESTIONS

75% 1. Describe in detail, **two of the options** from Group I **(25 points each),** and **one option** from Group II **(25 points**). For each detailed description include:

A: General Administrative description of the option.
B. Specific provisions of the option.
C: Major Constraints and relative cost of implementation.
D: Type of ownership to which the method is best suited.
E. General description of an ownership suited to use of the option.

Group I

Non-industrial timber management plans (NTMP)
Modified timber harvest plan (MTHP)
Sustained Yield Plan (SYP)

Group II

Conversions (CON)
Exemptions (EX)
Emergency notices

25% 2. Describe the conceptual differences between the Timber Harvesting Plan (THP) process and the Program Timberland Environmental Impact Report/Program Timber Harvesting Plan (PTEIR/PTHP) process. Also describe the advantages and disadvantages and process and objectives of the PTEIR/PTHP.

END OF QUESTION

QUESTION X- FOREST MANAGEMENT

OBJECTIVE

To demonstrate your ability to integrate range and forest management techniques on a single property.

SITUATION

A rancher owns 2000 contiguous acres of forestland at 4,000 - 5,000 foot elevation that includes 200 acres of wet meadow and a Class II stream. She wishes to manage her property on a sustainable basis for regular income, optimize forage production and grazing opportunities (for possibly both cattle and sheep) in the timberland and meadows, and to provide suitable wildlife habitat (she is predominately interested in deer).

Choose **ONE** of the following forest types:

A) Pacific slope mixed conifer
B) Westside Sierra conifer
C) Eastside Ponderosa and lodgepole pine

QUESTIONS

10% 1. For the timber area and wet meadow area (combined), identify two trees or shrubs, two grasses and one forb that you would expect to find and which are important forage plants. Indicate the palatability of each plant you have listed (high, medium or low) and for what animal (cattle, sheep and/or deer) your evaluation of palatability is based on. (Common plant names will be sufficient)

10% 2. In terms of range management, briefly describe the difference between biomass and forage, and how you would estimate the total volume of forage production available. Clearly state your assumptions.

3. When answering the following assume you have selected **either** the Shelterwood or Seed Tree Silvicultural System to manage timber stands and achieve the forage results the owner desires.

15% A. Briefly list and discuss five (5) pretreatment **forage** conditions that might be important items in making any plans for future silvicultural treatment.

CONTINUED NEXT PAGE

5% B. Briefly contrast how the actual silvicultural methods contemplated may affect **forage** resources.

5% C. Briefly discuss the effects of contemplated site preparation methods on **forage** resources.

5% D. Briefly discuss how effects of intermediate silvicultural treatments will effect the forage resource in terms of forage composition and growth.

25% 4. **List** five potential benefits and five potential disadvantages of allowing grazing in plantation or regeneration sites. Also, generally describe how the owner could manage her livestock to enhance benefits and to minimize the disadvantages that you have listed.

25% 5. Many resources and/or site conditions on such a property are important for wildlife habitat and fisheries. Describe five ways the wildlife and fisheries resources can be negatively impacted by livestock use. Describe what accepted and commonly used livestock and range management practices can be used to effectively manage these resources?

END OF QUESTION

END OF EXAMINATION