

2024 Community Forestry Test Answer Key

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168 points total

Section 1: endecophagy (11 pt)

1. *Cupressus macrocarpa* (1)
2. There are only two natural groves: one in Point Lobos Reserve (1) and one in Del Monte Forest at Point Cypress (1) (accept two groves near Monterey and Carmel and half point for west-central California)
3. Because it is moderately fire serotinous, it does not entirely depend on fire to reproduce, as hot weather can cause cones to open (1). However, a lack of fire means that forests will have a narrower population age structure (1)
4. Cypress canker (1), caused by the fungus *Seiridium cardinale*.
5. It is typically exposed to high winds on cliffs beside the ocean (1)
6. A (1)
7. According to a Greek legend, Apollo immortalized the youth Cuparissos, for which the genus *Cupressus* is named, by turning him into a cypress, as they have long lifespans (1)
8. Coastal sea fog belt (1)
9. C (1)

Section 2: Never Gonna Give Pines Up, Thenerdicat (24 pt)

10. Figure B: Lodgepole pine (1); Figure E: Jack pine (1)
11. (Any 2 of the following, 1 pt each):
 - Jack pine cones are very distinct; curved & closed, asymmetric, small, cone scales sealed shut, attached to twigs vs lodgepole pine cones that are much longer, grow with pokey, raised scales with bristles, more elongated, and overall larger
 - Jack pine needles are much shorter than lodgepole pine needles; jack pine has a needle length of $\frac{3}{4}$ -1 $\frac{1}{2}$ " vs lodgepole pine has almost double the needle length of 1 $\frac{1}{2}$ -3"
 - Jack pine needles are more flattened & bent with blunt tips near the twigs; lodgepole pine needles are more rounded overall and much more twisted (hence epithet *contorta*)
 - Jack pine bark is dullish reddish-brown and scaled; lodgepole pine bark has a scruffy texture (think popcorn ceiling) with a grayish-orangish-red tint
12. The figure is showing fringe spread (1). This shows that *P. contorta* initially invades areas by establishing trees 50m downwind (1) from parent trees (1) and its prolific seed production (1)
13. B (1)
14. A pure stand is a group of trees (1) where 80%+ of the composition is of the same species (1)
15. B (1)
16. Post-burn sites have exposed mineral-rich soil due to fires (1) which allows for jack pines to invade & colonize such sites (1)
17. (Any 2 of the following: 1 pt per strategy, 1 pt per explanation of strategy, max 4 pts):
 - Serotiny/delayed seed release – cones are serotinous (opening up cones & releasing seeds after high temperatures, usually fire), meaning they can delay seed release & reestablish themselves relatively quickly on postburn sites
 - Early reproductive maturity – early reproductive maturity allows for greater cone production earlier on → greater preparation for the next burn cycle
 - Colonization of postburn sites – jack pine's ability to quickly establish seedlings on mineral-rich soils allows for it to quickly colonize postburn sites → success in reestablishing populations in post-fire forestsFrom: <https://www.fs.usda.gov/database/feis/plants/tree/pinban/all.html>
18. D (1)
19. Vitamin C (1)
20. Post-[coal] mine soils are rather acidic (1), and *P. strobus*' ability to tolerate lower pHs (1) ranging from 4.0-6.5 make it a great choice to stabilize mine soils, paired with their wide spreading roots/deep growth (1)
21. B (1)

Section 3: ur1 (15pt)

22. Red alder (1)
23. *Betula nigra* (1)
24. Birch family/*Betulaceae* (1), catkins (1)
25. 20 - 30m (1), 32m (1)
26. *Frankia* (1), it allows the tree to grow in nitrogen poor soils, grow rapidly, and become an early colonizer of disturbed areas (1)
27. It was possible to make a dye because of the tannins in the bark, native americans used this dye to make fishing nets less visible underwater (1)
28. B (1)
29. It's older/maturing (1)
30. Along stream sides, forested wetland areas containing moist soil, floodplains, stream banks (1)
31. C (1)
32. Unique and distinct bark (1), they have much whiter bark than the normal wild type (1)

Section 4: NYC Street Trees, chrys3039 (25pt)

33. See below: (0.5pt for each correct name, 5pt total)
 - a. American Sycamore / *Platanus Occidentalis*
 - b. Pin Oak / *Quercus Palustris*
 - c. Green Ash / *Fraxinus Pennsylvanica*
 - d. American Sycamore / *Platanus Occidentalis*
 - e. Green ash / *Fraxinus Pennsylvanica*
34. London Plane Tree (1), it is a hybrid between American Sycamore and *P. Orientalis* (Old World Sycamore or Oriental Plane) (1)
35. Newer layers of bark push out the old layers of the bark to make room for new growth. Pushing the old layers off which dies and falls off the tree. (1) The species in Figure N evolved in riparian environments, where there is plentiful water, thus, it never needed to develop thick bark to contain water inside of it. Thus, why it evolved to so readily give away its bark (1) The under bark might be able to perform photosynthesis (1)
36. They can tolerate flooding and heavily polluted areas (1)
37. Emerald Ash Borer (1), It is native to Asia (1), Any one of the following (1): You will begin to see thinning of the leaves in the canopy, usually starting at the tops and sides. "D" shaped exit holes on your tree definitely indicate Emerald Ash Borer. Underneath the bark, Emerald Ash Borer will make "S" shaped galleries as it tunnels through the tree
38. Genus *Ulmus* or Elms (1), Dutch Elm Disease (1)
39. Moist and acidic soils (1)
40. Any one of the following (1): Causes the branches to droop, causing issues for traffic (even fall off); grows so big it is impossible to treat nutrient deficiencies; may develop Iron Chlorosis, causing leaves to drop off during growing season and may rot from the top down
41. It has a shallow root system (1)
42. B (1)
43. CE (1)
44. Any one of the following (1): They are all adapted to wet environments, much more than other members in their respective genera; can tolerate flooding; can handle urban pressures such as pollution
45. Buttonball Tree (1), over 113 ft or 34 m tall (1), ~350 - 400 years old (1)

Section 5: Staring out an open window catch my death, roonisaurus (25pt)

46. American chestnut (1), *Fagaceae* (1), D (1)
47. Nut (1)
48. Chestnut blight (1), Any two: Small orange-brown area on the tree bark, canker, orange stoma, discolouration, dieback (1 each), Cankers girdle the tree (damage the bark, interrupting flow of nutrients) (1)
49. East Asia (1), Japanese chestnut trees carrying the fungus were imported into the US (1)
50. ABF (1)
51. B (1), rapid growth/shade tolerance of maple (1), oak mast crops replaced chestnut crops (1)
52. Any two: High density of trees within range, lack of immunity, low genetic diversity of stands, salvage logging destroying healthy trees, other pathogens weakening trees and allowing easier infection (1 each)
53. Any one: Blight keeps reinfesting stump sprouts, uses oaks in the range as hosts, chestnut stumps still contain active fungi, other pathogens barring reintroduction (1)
54. Any two: American-Chinese chestnut hybridisation, transgenic blight-resistance/Darling 58/genetic engineering, backcrossing, introducing hypovirus to infect the fungus causing chestnut blight (1 each)
55. Gall (1), chestnut gall wasp females lay eggs in buds → larva hatch and induce galls (1), the opened gall left by the wasp after it matures and departs may be an entrance through which the fungus can infest the tree's tissues (1)
56. Shifting northwards (1), increasing temperatures lead to trees growing in areas more suited for their growth (1)
57. Increase as disease thrives in warmer conditions (1)

Section 6: joshuatree1694 (13pt)

58. Pacific yew (1)
59. Paclitaxel or Taxol (1), for chemotherapy drugs (1)
60. Near-threatened (1)
61. Aril (1)
62. Eastern redbud (1)
63. Bees (1)
64. Oklahoma (1)
65. Mainly planted as an ornamental tree (1)
66. Black tupelo (1)
67. True (1)
68. Tupelo likely comes from the Native American Creek nation words “ito” which means “tree,” (1) and “opilwa” which means “swamp” (1). Through the ears and mouths of European immigrants, those two Creek words eventually transmuted and evolved into the name tupelo.

Section 7: Are You An Oak Because I'm Nuts About You, kokonattsuu (15pt)

69. *Quercus douglasii* (1), Blue oak (1)
70. High genetic diversity (1), allows populations to maintain a wide range of traits that can be selected for in response to environmental changes (1)
71. (2 pt per reason, 3 reasons)
- Leaves become reinforced with cellulose and lignin (1) to withstand stresses (1)
 - The upper surface of blue oak leaves have a thick, waxy coating (1), which reduces evaporation and gives the leaves their characteristic bluish hue (1)
 - Also, the canopy of these trees is fairly open (1), so blue oaks have fewer leaves relative to less drought-tolerant species. This means they have less leaf surface from which water can evaporate (1)
72. Answers can do with genetics ,genetic engineering in particular (2). Case by case scenario for grading, read upon selective breeding, restriction enzymes for cutting DNA. Breeding programs for drought tolerance have been developed for crops such as rice, wheat, maize, and Indian mustard. These programs have incorporated traits such as salt tolerance, alkali soil tolerance, and drought tolerance into the plants, with successful results.
73. They form a symbiotic relationship with the roots of plants (1), where the fungi provide the plant with nutrients such as phosphate and nitrogen (1). In return, the plant provides the fungi with carbohydrates produced during photosynthesis (1).

Section 8: Alien Space Invaders 🤖, deasert_willow (16pt)

74. AB, Figure AB, Ailanthus (and other common names), or *Ailanthus altissima* (2)
75. Anything similar to “an introduced, nonnative organism (1) that begins to spread from its original introduction site that has the potential to cause harm (1).”
76. China (1)
77. Anything similar to “the chemical inhibition of one plant (or other organism) by another, due to the release into the environment of substances acting as germination or growth inhibitors.” (1), mentions ailanthone (1), Anything similar to “inhibits the growth of other organisms.” (1)
78. Bradford Pear, Callery Pear, or any other common names (1): do not accept varieties of the tree other than “Bradford”
79. Planted as an ornamental or woodworking (1)
80. D (1)
81. Anything similar to “hybridization between an invasive tree and a non-invasive tree can result in a decline of native tree populations (1) due to trees more suitable for taking over an area becoming common (1).”
82. *Triadica sebifera* (1)
83. AC (1 per correct letter, -1 per incorrect letter, minimum score zero)

Section 9: Leguminosa!, violarights (24pt)

84. Figure AG: *Gleditsia triacanthos* (1), Figure AH: *Robinia pseudoacacia* (1), Figure AI: *Albizia julibrissin* (1)

85. See below:

85.1: Nitrogen fixation (1), atmospheric nitrogen is converted in ammonium, which can then be converted into nitrites and nitrates and taken up by plants (1).

85.2: AH, AI (1) - accept AG if reasoning for 85.4 is valid

85.3: *Rhizobium/Rhizobia*, (1) they are hosted in the root nodules of legumes (1), and then combine the atmospheric nitrogen with oxygen/hydrogen to fix it into other compounds (1).

85.4: As long as reasoning is valid, credit is given: (2 for either argument)

- Capable of nitrogen fixation: Potential for nitrogen fixing bacteria to be hosted in other areas of the plant, intermediate concentrations of nitrogen can be found in the litter/seeds/foilage, Presence of clusters that resemble rhizobial colonies in the inner cortex of roots
- Not capable of nitrogen fixation: belongs to a subfamily where nodulation is not usually exhibited, Honey locust does not have root nodules on its roots
- If stated “It has root nodules/hosts nitrogen fixing bacteria” it is **incorrect**

Interesting read here:

<https://www.nrs.fs.usda.gov/pubs/gtr/gtr-p-24%20papers/63vansambeek-p-24.pdf>

86. See below:

86.1: They all are/have the potential to be invasive (1), which can outcompete native flora and lower biodiversity (1)

86.2: Nitrogen fixation allows them to have a nutrient advantage and allows them to colonize nitrogen-deficient soils other plants can't compete in (1).

86.3: Nitrogen fixers can increase availability of nitrogen in the soil, can potentially increase biodiversity and serve as a food source in the environment (1)

86.4: In the eastern U.S it is often short lived due to mimosa vascular wilt (1), has not affected the population as it is still thriving in the area (1)

86.5: Glyphosate (Roundup)/triclopyr (1), Any two of the following (1 each): controlled burns, foliar spray, mowing the lawn to remove black locust sprouts/seedlings, cutting down the stump as close to the ground as possible, etc.

87. It has thorns (1), and evolved to protect the trees from Pleistocene megafauna (1)

88. Black locust has spines (1). Spines are modified leaves/leaf parts/stipules and derive from the plant's epidermis/may contain vascular tissue. Thorns are modified stems, branches, or branch parts that have hardened, typically formed from axillary buds/stems and lack vascular tissue (1)