2024 Community Forestry Test

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Section 1: The path of all great souls is one walked alone (11pt)

1. What is the scientific name of the species in Figure A? [1]

2. The species in Figure A is known as paleoendemic, as it historically had a wider, less restricted range. What is its current natural habitat? [2]

3. How does fire suppression impact the species in Figure A? [2]

4. Climate change makes the species in Figure A even more susceptible to which disease? [1]

5. Why does the species in Figure A's crown often become asymmetric and contorted with age? [1]

6. What is the species in Figure A sometimes referred to, especially in folklore, due to its extremely similar appearance? (hint: It is sometimes referred to as the "sacred cedar of the Holy Land") [1]
   (a) Cedar of Lebanon
   (b) Sacred Pine
   (c) Jerusalem Fir
   (d) Cypress of Eden

7. Explain the etymology of the genus that the species in Figure A is in. [1]

8. The species in Figure A are bathed in the _____ during cool summers in which they thrive?

9. Which of the following explains the high endemism present in the species in Figure A's natural habitat? [1]
   (a) Occurrence of quartz diorite
   (b) Serpentine soils that create plant communities with "stunted" growth habits, deeper roots, and greater tolerance to heavy metal presence
   (c) Cold-water upwelling in a nearshore submarine canyon that created a climatic shield on land from xerothermic conditions
   (d) All of the above

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

In mourning for the fact that the 2023-2024 Forestry List has taken 7 iconic pines from us, this station will center entirely on pines. You are on an expedition with the revered Dr. Gerald, touring and sampling native North American pines to convince SOINC that pines are indeed cool and anyone who hates them are just bad.

Refer to Figures B - H4 for questions 10-17.

10. Refer to Figures B and E. Both belong to the same subsection, *Pinus* subsect. *contortae*. List common names for both. [2]

    10.1 Figure B:

    10.2 Figure E:

11. How would you differentiate the species in Figures B and E? List at least 2 physical differences to identify the difference between these two species. [2]

12. The species in Figure G is known for its ability to invade ungrazed, low vegetation-density grasslands. Refer to Figure F. What is it showing? What does this say about the methods the species in Figure G takes to invade areas of New Zealand? [4]

13. A hybrid between the species in Figures E and G is known as Murraybanks' pine, *Pinus x murraybanksiana*. Given the range map (Figure D) shown of one of the parent species that makes up this natural hybrid, which of the following is the *most likely* range of overlap for these two species? [1]

    (a) Figure H1

    (b) Figure H2

    (c) Figure H3

    (d) Figure H4

14. Barrens of young, pure stands of the species in Figure C are special breeding grounds for Kirtland's warbler (*Setophaga kirtlandii*). What is a pure stand? [2]

15. Mature forests of the species in Figure E provide great spots for blueberries (*Vaccinium spp.*) to grow. This is mostly likely because mature forests of this species are: [1]

    (a) Shade intolerant and provide ideal competition for blueberries to grow

    (b) Open and provide space for blueberries to grow in the understory

    (c) Susceptible to fire so regenerate with enough space for blueberries to grow

    (d) Fixate enough nutrients to make the soils rich enough for blueberry growth

16. The species in Figure C invades exposed areas shortly after disturbances. How does fire play a role in this species' ability to invade and colonize sites? [2]

17. A strategy the species in Figure C utilizes to reestablish after fires is rapid growth that allows for trees to quickly regrow/regenerate. What are two other strategies this species uses in relation to its fire ecology? List and explain both. [4]

Refer to Figures I - K for questions 18-21.

18. Refer to Figures J and K. During the colonial era of US-North American history, the species in these figures was valued for its high-quality wood that would be used to build a variety of buildings and infrastructure. However, when the Bri'ish imported this species back to their miserable 'ole isle, it failed as a timber crop. This is due to the fact that: [1]

    (a) The soil in Britain was so terrible saplings wept and failed

    (b) Climate differences across the pond were drastic and thus this species failed to adapt

    (c) The pines were too filled with revolutionary 'Murican spirit and rebelled against the Bri'ish that tried to plant them on another continent

    (d) White pine blister rust was a rampant issue across planted trees so it saw little success in Bri'ain

19. Refer to the species in Figure I. Both the cambium and needles of this species are edible; the needles especially are used to brew tea used to prevent scurvy. What compound must this species' needles contain high quantities of? [1]

20. The species in Figure I has been planted for its abilities to stabilize past strip-mine soils, especially on past coal mine soils. What properties of this species allow for it to tolerate such poor-quality soils? [3]

21. Given what you know about these species' ranges, which of the following species would *most likely* overlap in range? [2]

    (a) Figures B & E

    (b) Figures C & J

    (c) Figures B & I

    (d) Figures C & E

Section 3: (15pt)

22. What is the common name of the species in Figure L? [1]

23. What is the scientific name of the species in Figure M? [1]

24. What is the family name of the family that the species in Figures L and M are from? What kind of flowers do they produce? [2]

25. How tall does the species in Figure L usually grow in meters? How tall is the official tallest tree of that species? [1]

26. The species in Figure L hosts a nitrogen-fixing actinomycete called _____. Why is this significant? [2]

27. How was the bark of the species in Figure L used? [1]

28. The species in Figure L currently makes up _____ of the total hardwood volume in the Pacific Northwest. [1]

    (a) 40%
    (b) 60%
    (c) 80%

29. If a tree the same species as Figure M was found with reddish-brown bark furrowing into thick, irregular plates, what could you tell about its age? [1]

30. What kinds of habitats does the species in Figure M thrive best in? [1]

31. The species in Figure M is _____ of flooding, and _____ of shade. [1]

    (a) intolerant, intolerant
    (b) intolerant, tolerant
    (c) tolerant, intolerant
    (d) tolerant, tolerant

32. Why is the species in Figure M often a favored ornamental tree? What features do the cultivars 'Heritage' and 'Dura Heat' possess? [2]

Section 4: NYC Street Trees (25pt)

33. Identify the species found in Figures N - R with their common and scientific names (there are two pairs of images that are the same species) [5]

    33.1 Figure N:

    33.2 Figure O:

    33.3 Figure P:

    33.4 Figure Q:

    33.5 Figure R:

34. What is the specific cultivar of the species in Figure N? How was it formed? (It is the most common tree in New York City) [2]

35. Why does the species in Figure N shed its bark? Why did it evolve that way? (Secret bonus point answer is available, something to do with photosynthesis) [3]

36. Why are all of the species in figures N - R planted in urban, flood-prone, heavily polluted, and overall nasty city environments? (Only New Yorkers get to say this, best city in the world fr) [1]

37. What insect caused the downfall of the species in Figure P? Where is it native from and when was it discovered in America? What is one of its symptoms? [3]

38. The species in Figure P competed with another tree genus for the most planted ornamental tree around the US until they were struck down by a certain disease. Which tree genus is this, and what disease did they get hit by? [2]

39. What soil conditions does the species in Figure O like the most? [1]

40. Why might growing the species in Figure O in a less suitable environment cause issues? [1]

41. What makes the species in Figure O a lot easier to transport and grow than others of its genus? [1]

42. Imagine yourself as a gardener who would love to be host to a special type of caterpillars, especially the very cute *Bucculatrix Domicola* (ENTO LOVE LETS GOOO). Which species in Figures N - R would be the best option? Mark all that apply [1]

    (a) Figure N
    (b) Figure O
    (c) Figure P
    (d) Figure Q
    (e) Figure R

43. You are thinking about planting a new tree in your massive backyard, and you also want to host a population of frogs in it. Along with that, having shade and a wind-break would also be cool because your house is wayyyy too old for modern architecture. Which species in Figures N - R is the **best** option? Mark all that apply. [1]

    (a) Figure N
    (b) Figure O
    (c) Figure P
    (d) Figure Q
    (e) Figure R

44. What is one thing all of the species in Figures N - R above have in common? (Hint: NYC's climate) [1]

45. Out of all of the individuals of the species in Figure Q, what is the name of the tallest individual, how tall is it, and how old is it? [3]

Section 5: Staring out an open window catching my death (25pt)

46. Identify the species in Figure S by its common name, as well as its family and IUCN conservation status. [3]

    (a) Least Concern
    (b) Vulnerable
    (c) Endangered
    (d) Critically Endangered
    (e) Extinct in the Wild

47. What type of fruit does the species in Figure S produce? Give the botanical name. [1]

48. What disease decimated populations of the species in Figure S? List two symptoms of this disease and briefly describe how it kills trees. [4]

49. Where is this disease referenced in question 48 native to? How did it spread to regions where the species in Figure S is native to? [2]

50. Before the outbreak of the disease referenced in question 48, the species in Figure S was quite abundant within its range. Select all that contributed to this abundance. [1]

    (a) Rapid growth
    (b) Fire resistance
    (c) Insect resistance
    (d) Allelopathy
    (e) High shade tolerance
    (f) Large fruit crop

51. The species in Figure S used to be a dominant tree in eastern forests, but after the outbreaks, they were nearly eradicated. Observe the chart in Figure T. Based on these data, select the trees that most likely replaced this species. Why might this be? [3]

    (a) Loblolly pine and northern red oak
    (b) Chestnut oak and red maple
    (c) Pecan and yellow poplar
    (d) Black tupelo and sugar maple

52. Name two factors that allowed the disease referenced in question 48 to spread so easily among tree populations. [2]

53. Why is it so hard to reintroduce the species in Figure S back into its native range? Name one reason. [1]

54. What are two currently researched ways to restore tree populations? [2]

55. What is the structure shown in Figure U called? What caused it to form, and how might it make the tree more susceptible to the disease discussed in question 48? [3]

The maps shown in Figure V are adapted from a research paper published in 2017. It depicts an approximation of suitable and unsuitable regions for this species in 2010, 2040, 2070, and 2100 under high-emission RCP 8.5 climate-change scenario.

56. What trend do the maps in Figure V suggest about the population and range of the species in Figure S? What could have caused this trend? [2]

57. How might climate change affect the number of trees infected with the disease referenced in question 48? [1]

Section 6: (13pt)

58. What is the common name of the species in Figure W? [1]

59. What chemical is harvested from the species in Figure W? What is that chemical used for? [2]

60. What is the conservation status of the species in Figure W? [1]

61. What is the red thing in Figure W called? [1]

62. What is the common name of the species in Figure X? [1]

63. How is the species in Figure X pollinated? [1]

64. What state is the species in Figure X the state tree of? [1]

65. What is the main commercial use of the species in Figure X? [1]

66. What is the common name of the species in Figure Y? [1]

67. T/F: The fruit of the species in Figure Y is edible. [1]

68. What is the etymology of the common name of the species in Figure Y? [2]

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

69. Name the scientific name and common name of the species shown in Figures Z and AA (they depict the same species). [2]

70. What is the genetic diversity in populations of the species in Figures Z and AA, and how does it affect their ability to adapt to changing environmental conditions? [2]

71. List and explain 3 adaptations that the species in Figures Z & AA has for drought tolerance. [6]

72. How can we use the information in question 71 to breed more drought-tolerant crops? [2]

73. What is the role of mycorrhizal fungi in nutrient uptake? [3]

Section 8: Alien Space Invaders (16pt)

74. Which of the species in Figures AB, AC, or AD is an invasive species? [2]

75. What is the definition of an invasive species? [2]

76. Where does the invasive species identified in question 74 originate from? [1]

77. What is allelopathy and how does it benefit the invasive species identified in question 74? [3]

78. Identify the species in Figure AE by common name. [1]

79. What is a common commercial use of the species in Figure AE? [1]

80. How is the species in Figure AE pollinated? [1]

    (a) Wind pollination
    (b) Water pollination
    (c) Self pollination
    (d) Insect pollination

81. *Morus alba* and its sister plant *Morus rubra* are known for hybridization. How can hybridization between an invasive and non-invasive plant be detrimental to the native populations of other species? [2]

82. Identify the species in Figure AF by scientific name. [1]

83. Which two of the following can pollen of the species in Figure AF cause? [2]

    (a) Hay fever
    (b) Nausea
    (c) Allergic reactions
    (d) Rheumatic fever
    (e) Death

Section 9: Leguminosa! (24pt)

84. Please identify the species in Figures AG - AI by scientific name. [3]

    84.1 Figure AG:

    84.2 Figure AH:

    84.3 Figure AI:

85. The family of species in Figures AG - AI is capable of doing some amazing ecological magic involving a certain limiting nutrient.

    85.1 What is the name of this "magic", and describe the general process. [2]

    85.2 Which figures in Figures AG - AI is/are wizard(s)? [1]

    85.3 Well technically, it's a phony - the trees need help to do it. What actually does the magic (please give the genus), where is it, and how? [3]

    85.4 Is the species in Figure AG a phony, or is it a double phony? (Is it capable of the process?) Please provide reasonable explanations. [2]

86. Just because they can do this summoning magic referred to in the previous questions does not mean they are all good for the environment.

    86.1 How do the species in Figures AG - AI negatively harm other organisms and the environment? [2]

    86.2 How does the previous "magic" help them perform these evil tasks? [1]

    86.3 Even though they have nefarious intentions, what is a way they can benefit the environment? [1]

    86.4 In regards to the species in Figure AI specifically, it generally operates in a certain area of the United States. In a different area, it is not as effective. Why is this? [2]

    86.5 Herbicides are great ways to commit herbicide. Please name a specific herbicide that is effective on the species in Figure AH, and 2 other ways you can control them. [3]

87. The species in Figure AG is notorious for being, well, prickly. Why did it evolve this way? Please be specific, and make sure to name the proper structure. [2]

88. The species in Figure AH also has structures that appear similar to the ones that the species in Figure AG has, but are actually different. What are these structures, and how are they different from the ones above? [2]