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Station

2010 Missouri Envirothon Forestry Ecostation

Team #

1. What is the common name of tree #1? (2 points)

2. What is the common name of tree #2? (2 points)

3. What is the common name of tree #3? (2 points)

4. The diameter at breast height of a tree is measured where? (2 points)

Uphill side of the tree and 4.5 feet above the ground

5. Using a d-tape, what is the diameter of tree #1 in inches and tenths? (2 points)

6. Using a Biltmore stick what is the diameter of tree #2 in inches (2 points)

7. Using the volume chart provided and the height pole already set and in place, how many board feet of wood is in tree #2? (4 points)

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8. Match the forestry tool with the correct description (6 points)

- | | |
|--------------------------|--|
| 1. _____ Clinometer | a. used to determine basal area |
| 2. _____ Cant Hook | b. used to measure distance by tying a String to an object and walking |
| 3. _____ Hip Chain | c. determines the diameter by converting circumference to diameter |
| 4. _____ 10 factor prism | d. used to determine the age or growth rate of the tree |
| 5. _____ Diameter Tap | e. measures angles of elevation or depression |
| 6. _____ Increment Borer | f. used to roll or position logs |

9. Using the map supplied on the table: Smoke has been spotted from the Marcoot fire Tower at 175 degrees and from Buick fire tower at 212 degrees. What is the name of the hollow where the fire is located? (3 points)

10. Slope and Aspect can have a strong influence on what type of vegetation will grow on a particular site Define the two terms, slope and aspect (2 points each) and explain how vegetation is affected (3 points).

- a. Slope = measurement, usually in % of the angle, or steepness of a landform.*
- b. Aspect = orientation in relation to compass direction; the east side of hill has an east aspect.*
- c. The amount and intensity of sunlight reaching a site is strongly affected by slope and aspect, particularly on steep slopes. N and E facing slopes tend to be cooler and more moist. S and W facing slopes tend to be hotter and drier. This affects productivity, species composition, fire effects, soil conditions, etc.*

11. If a standard Cord of wood measures 4 feet wide by 4 feet tall by 8 feet long, how many cubic feet of wood is in it? (2 points)

128 cubic feet



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12. Foresters often examine the rings of a tree. These rings can give us clues to many different things. Name two (2) things they might indicate to a forester. (4 points)

The most common information obtained from tree cores is tree age and rate of growth. Forest managers often use these data for decision-making. Decreased growth rates, evident by narrower growth rings, indicate reduced vigor resulting from environmental factors such as overcrowding, pest damage or drought. Informed decisions on when and how to harvest timber or to conduct other forest improvement operations may be made using tree rings as an indicator of management needs.

Other information such as wood quality, past climatic conditions, as well as past fire frequency also may be determined. Wood quality is assessed by measuring the bulk density of the core. Bulk density simply is the weight of a set volume of wood. Higher bulk densities generally indicate increased strength properties.

The most specialized use of tree cores is dendrochronology, which is the dating of past events, such as drought and wildfire, through the study of tree ring growth. Historic climatic conditions may be indicated by the percentages of early to late wood. Poor growing conditions are indicated by narrow growth rings and a greater percentage of late wood. Frequency of wildfires also may be determined by examining cores for fire scars.



1. Trees play a very important part in Missouri both socially and economically. Match the trees with their best uses or designations. (5 points)

- | | |
|-------------------------------|------------------------------------|
| 1. <u>e</u> White Oak | a. Used for making syrup |
| 2. <u>b</u> Flowering Dogwood | b. State Tree of Missouri |
| 3. <u>d</u> Hawthorn | c. Used in furniture making |
| 4. <u>c</u> Yellow Poplar | d. State Flower of Missouri |
| 5. <u>a</u> Sugar Maple | e. Used for making whiskey barrels |



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1. The Moreau River which runs along the Carver Farm border has trees growing next to its shoreline. Limbs and whole trees, sometimes, fall into the water. Elaborate on the value of woody debris in the pond at this site. (5 points)

Woody debris provides fish habitat; organic matter for the food chain; substrate for bacteria and invertebrates; loafing locations for turtles and amphibians
2 or more – full 5 points
1 – 2 points

2. ?. (5 points)

A grass land use because it allows less infiltration of rain than forest land.

3. Explain the importance of trees growing along the side of the Moreau River including how they control erosion and affect water quality. (5 points)

temperature regulation; source of nutrients to invertebrates and microorganisms; streambank stabilization; clean water, water filtration; habitat (large woody debris); slowing flood flows
(1 point for each benefit, up to 5)



1. Open grown tree canopies such as these found on the large white oaks, here at this station, differ from a tree grown under a dense forest setting. Explain how they are different. (5 points)

The large tree developed in a more open environment, either in a native savanna/open woodland or a naturalized pasture. This allowed the trees to spread its branches wide to capture as much sunlight as possible. The smaller trees developed as the area grew up in trees (absence of fire, mowing, or heavy grazing). They came in at a high stocking level and have had to compete for available light.

2. As a forest ages, large old-growth type trees are important for several species of wildlife. What is the term used for this type of tree within the forest and list three species which might use this type of tree. (5 points)



*Wolf Tree or Den Tree
Raccoon, Squirrels (Tree and Flying), Pileated Wood Pecker*

3. Are northern red oak trees at this station considered a “mast bearing” species? Explain why this is an important factor in wildlife management. (5 points)

Hard mast produced from oaks is an important winter food source to many wildlife species in Missouri. Acorns have a long “shelf life” and remain a viable source of food long after they fall from the tree.



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1. Trees are more than just a source of organic matter for soils. What other soil related functions do they provide? (5 points)

They help break rocks apart and mix soil articles, and root channels provide pathways for water and air movement through the soil.

2. Trees growing on soils with a hardpan are often more susceptible to wind events (blowdown). Why? (5 points)

In sites where rooting is shallow, wind may cause trees to blow down. Shallow rooting can be the result of wet soils like those found in wetlands, or can be caused by shallow soils underlain by impervious layers that resist penetration of roots.

3. During the construction of new homes or buildings, trees growing close to the construction site are often negatively impacted. Explain how they are impacted and how damage can be minimized. (5 points)

- *physical injury to the trunk and crown*
- *soil compaction in the root zone*
- *severing of roots*
- *smothering roots by adding soil*
- *split and broken branches*
- *new exposure to wind and sunlight*

Tree protection methods such as fencing and corrective pruning are important before, during and after construction occurs. Although tree assessment is needed before construction begins, it is also vital after the project ends since there may be a lag time between the damage and the visible symptom.

2 points for naming two negative impacts, 1 point each for the underlined points.

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1. Orchards, vineyards and large greenhouse operations are examples of intensive plant production operations. What possible contaminants could enter watersheds from these types of land uses? (3 points)

Irrigated crops (berries, Christmas trees, hops, mint, orchards, vineyards, nurseries, greenhouses, vegetables, sod) pose a moderate risk of contaminating groundwater. NOTE: Drip-irrigated crops are considered lower risks.

High-value crops, such as nursery crops, greenhouse crops, orchards, and vegetable crops, are more likely to receive high application rates of nitrogen fertilizers. Any excess nitrogen that is not used by plants may become a source of pollution.

Excess irrigation water can carry huge quantities of pesticides, herbicides, or nutrients that are harmful in surface water.

2. This Nature Center is surrounded by urban housing. What are three potential contaminations we might find in the watersheds around here? (3 points)

pollutants come from a variety of sources including air deposition and car exhaust which settle on surfaces such as city streets, driveways, parking lots, and lawns. These pollutants remain until a storm washes them into a nearby storm drain. Automobiles are one of the leading sources of pollution in urban areas. Streets are also major pollution generators because of the large area they cover and the number of cars that use them. Typical pollutants from developed areas include bacteria, pesticides, fertilizers, oils, salt, litter, and sediment. Runoff from some non-vegetated areas, such as construction sites, can carry high sediment loads

3. How might urban forests help to improve the quality and quantity of groundwater supplies to urban communities? Provide 3 benefits. (9 points)

- Tree foliage filters dust and can help remove toxic pollutants from the atmosphere. The foliage captures and removes a wide range of smog-producing compounds such as ozone, carbon monoxide, nitrogen oxide, airborne ammonia and some sulfur dioxide.*
- Trees intercept rainwater aiding soil absorption for gradual release into streams, preventing flooding, filtering toxins and impurities, and extending water availability into dry months when it is most needed.*
- Water from roots is drawn up to the leaves where it evaporates. The conversion from water to gas absorbs huge amounts of heat, cooling hot city air and helping to offset the "heat island" effect resulting from glass and concrete surfaces.*
- Trees and shrubs slow down rainwater, helping runoff to soak into the soil at a slow and even rate. This takes the pressure off storm sewers and allows for groundwater recharge.*