

## Envirothon Forestry Questions 1999 - 2010

Name 3 ways humans use fire? **Heat, cooking and energy**

Roads, ditches, water or other physical features devoid of natural fuel are called? **fire breaks**

A \_\_\_\_\_ provides a record that scientists can use to determine when in history a fire occurred. **Scar**

What are the two classifications of fire? **Natural and Prescribed**

When are the forest fire hazard seasons in KY? **Feb 15 – April 30 and Oct 1 – Dec 15**

What is the predominate type of forest in KY? **Deciduous/Hardwood**

What is the state tree of KY? **Tulip Poplar**

What is a snag used for? **Wildlife**

What is the science and art of cultivating forest crops? **Silviculture**

Cutting all the trees on an area of forest, commonly called clear cutting, is never a desirable management option – **False**

Which exotic forest pest is principally responsible for hardwood tree defoliation in Kentucky and can spread by “hitching” rides on cars? **European gypsy moth**

Trees planted under utility lines should be: **low-growing to remain below the lines**

Which of the following environmental factors is responsible for harming tree health: Drought, insect attack, air pollution, forest fire? **All**

Which of the following species would be better suited for a tree planting on a dry, upland site? Yellow-poplar, black walnut, sycamore, **black oak**

Best Management Practices (BMP's) are? **Forest practices used to reduce or eliminate non-point source pollution of surface or groundwater.**

A shade tolerant tree is one that \_\_\_\_\_. **can live and grow underneath other trees**

At the end of the last ice age (18,000 years ago), the forests in Kentucky were generally: pines, **spruces**, ash and maple, oaks and hickories

Which type of tree is most beneficial for white-tailed deer? yellow-poplar, hickory, sweetgum, **white oak**

What is the unit of measure used for measuring sawn lumber in the US? cubic foot, **board foot**, pound, square foot

Which type of tree would be best suited for tree planting in a poorly drained, low land area? Hickory, white oak, black walnut, **green ash**

The practice of harvesting all or nearly all of the good quality trees in a stand and leaving behind trees of poor quality is known as? Diameter limit harvest, selective harvesting, **high-grading**, clear-cutting

Which carries water, nutrients, and minerals from the roots to the leaves of a tree? **Xylem**, phloem, heartwood, outer bark

When soils are compacted by construction equipment, trees usually decline because? Oxygen availability is reduced; the ability of the roots to absorb water and minerals decreases; root growth and expansion may be diminished; **all of the above**

What is the practice of cutting back trees to their stumps to promote better growth? Girdling, **coppicing**, pruning, topping

Approximately what percentage of Kentucky is forested? **50**

Having both male and female flowers on the same tree is called? **Monoecious**, dioecious, bioecious

What is the major cause of wildfires in Kentucky? Recreation, lightning, **arson/debris**, cigarettes/cigars

Where would walnuts grow best? **Bottomland**, upland, wetland

In what soil condition would pines grow best? Basic, neutral, **acidic**

What type of leaf does Kentucky's heritage tree have? Simple, pinnately compound, palmately compound, **bipinnately compound**

Which of the following tree species has an opposite branching pattern? white oak, **ash**, basswood, alder

What are the hours in which you can legally burn within 150 feet of a woods or wildland during fire season? **6 pm to 6 am.**

What two tree measurements are needed to calculate the merchantable board footage of a tree? **DBH and merchantable number of logs.**

The larvae of this forest pest are primarily responsible for the defoliation of principally oak species in the Eastern United States. This European species was originally introduced into the United States to breed with the silk worm in order to increase silk production. Tent caterpillar, bag worm, **gypsy moth**, fall webworm

What two measurements are used to find Site Index (SI)? Diameter and height; **age and height**; age and diameter; diameter and volume

What's the primary difference between hardwoods and softwoods? **Hardwoods typically lose their leaves (are deciduous) and are broadleaf; softwoods typically retain their leaves are not broadleaf and have cones.**

In addition to the age of a tree name one of several other factors that are indicated by the tree's growth rings. **climate; fire; defects; quality of site.**

Which disease commonly affects flowering dogwood in Kentucky: black knot, heart rot, **anthracnose**, fusiform rust

Which of the following is a defoliating pest that prefers oaks? Aphid, **Gypsy Moth**, Spider Mite, Tent Caterpillar

A 10% cruise on 100 acres would require a forester to measure \_\_\_\_\_ ¼ acre plots. 4, 10, 40, 50

Best Management Practices (BMP's) are: forest practices used to reduce or eliminate non-point source pollution of surface or groundwater; forest practices used to improve timber quality; forest practices used to improve timber growth rates; forest practices used to enhance wildlife habitat.

An example of a beneficial insect is: an aphid; the Gypsy Moth; the Ladybird beetle; the White Pine Weevil

A woodlot measures 345' by 170'. If the stocking rate is 225 trees per acre, how many trees would you expect to harvest if the area is clearcut? 135; 225; 250; 303

Which of the following trees has opposite branching? American Beech, Red Maple, Red Oak, Tulip Poplar

Which tree has a pinnately compound leaf? American Beech, black Birch, Horsechestnut, white Ash

An oak tree, with several hollows, was slightly damaged by lightning; the best approach to dealing with this tree in a multiple use forest is to: completely deaden the tree; harvest for lumber before it dies; leave as a wildlife tree; prune the tree to increase its value.

Does the urban forest cover the entire city? Yes

Which of the following is the most limiting environmental factor on tree growth? Moisture; sunlight; temperature; wind direction

If you are traveling on an azimuth of 128°, you are heading? Northeast, Northwest, Southeast, Southwest

Which data are required to determine site index? Age of tree and merchantable height; Age of tree and total tree height; Dbh and merchantable height; Dbh and total tree height

Urban trees can cool the air in a city up to 20 degrees.

Merchantable height is: commonly measured with a log scale; measured at the first fork in the tree depending on the species; measured to the minimum diameter based on products to be taken; not normally considered in the volume table

Which tree is not a pioneer species? Aspen, eastern red cedar, grey birch, white oak

Forest soils in Kentucky are commonly: Acidic

What is a dibble? a fire rake; a stereoscope; a recorder; a planting bar

A 67 acre tract of timber is being harvested. Two trucks are working and each truck will haul approximately 10 cords of wood at a time. Fifty cords will be cut each day. The mill will pay \$45 per cord delivered. This tract will get 23 cords/acre.

What is the gross income payment expected from the mill? \$69,345

How many days will it take to harvest the tract? 31

How many trips per day will each truck make to the mill? 2.5

How many cords of wood will be cut? 1,541

Name 3 examples of naval stores. Tar, pitch, turpentine, pine oil, resin

Match the following forest practice to the five pest management strategies. Answers may be used more than once. A. Biological; B. Chemical; C. Regulatory; D. Silvicultural

- Harvest mature trees or stands of trees to reduce the spread of insect or diseases. **Silvicultural**
- Fumigate nursery beds before sowing seed or planting to reduce nursery diseases. **Chemical**
- Release natural predators to reduce pest populations. **Biological**
- Thin overstocked stands of trees to encourage optimal growing conditions for the residual stand. **Silvicultural**
- Abide by quarantine regulations to reduce or eliminate the threat of an insect or disease infestation. **Regulatory**

A 500-acre section of your local national forest is invested with the pine bark beetle. Already 200 acres of trees have been found to be dead and another 1000 acres appear to be at risk of being infected. Large stands of infected trees can be a fire risk. In the area that is infected, and the surrounding area at risk, is an endangered species: the red-cockaded woodpecker. The red-cockaded woodpecker needs larger old pine trees for its habitat. Choose a management option below and state why you choose it and what would be the consequences. (This is worth 15 points so be thorough) **Each answer must address pine bark beetle (5 points); fire (5 points); and red-cockaded woodpecker (5 points) to receive the total 15 points.**

- Option 1 - Do nothing and let the pine bark beetle population grow until their population peaks and crashes. **Do nothing is always a management option as long as it is a conscious decision with possible results weighed as with other management options. Letting the pine bark beetle population grow until their population peaks and crashes may let nature take its course but the consequences may be to lose current habitat for the endangered species, the red-cockaded woodpecker.**
- Option 2 - Do a "sanitation cut" or group selection of trees from one area, that will remove dead and living uninfected and infected trees around the beetle bark infestation. **The result of this option would be an attempt to save the habitat for the endangered species, the red-cockaded woodpecker. This option will try and slow down and prevent the spread of the beetle bark infestation. By removing some of the dead trees, the likelihood of fire will be decreased. Removing live trees that are uninfected in front of the infestation will help prevent the spread of the insects.**
- Option 3 - Cut no living trees but remove dead trees only. **By removing some of the dead trees, the likelihood of fire will be decreased. This will not affect the beetle bark population that would continue to thrive in living trees. The endangered species, the red-cockaded woodpecker would face an increase in the likelihood its habitat will be changed by the bark beetle killing trees in its habitat area.**

Samara is a fruit type. What is its major characteristic? **Winged** What would be its likeliest mode of transportation? **Air**

What are the three key components that affect wildfire behavior? **Weather, fuel, ignition**

An indirect control of forest insects is? **Removing over-mature trees**

Name two vines that cause damage to trees. **grape, kudzu, honeysuckle**

What are the 3 sources from which a stand of trees may originate? **Buried seed, sprout or coppice, & planted seed or seedling**

How can brown spot in longleaf pine be controlled economically? **Prescribed burning**

Name a common timber stand improvement method. **Weeding, thinning, and sanitation cuttings.**

Explain the difference between a wild fire and a prescribed burn. Include in your explanation the three elements of the fire triangle. **A prescribed burn is designed and controlled by humans to aid the forest. A**

wildfire can either be arson, or caused by natural means but it is uncontrolled. The fire triangle is heat, fuel, and oxygen. (Anything along these lines is acceptable.)

Choose the best method or system to attain the specific management goal: (A) Pruning, (B) Clear Cut, (C) Seed Tree, (D) Selection, (E) Patch Cut, (F) Do Nothing, (G) Intermediate Thinning, (H) Esthetic Thinning, (I) Shelterwood, (J) Maintain fields by mowing in the fall, (K) Artificial Regeneration

- The landowner would like to improve the value of the pine trees. (G) Intermediate Thinning
- Create an uneven aged management system. (D) Selection
- Grow and manage Christmas trees. (K) Artificial Regeneration
- Create an even aged management system. (B) Clear Cut
- Create a site favorable for wild turkeys. (D) Selection
- Create a site favorable for the establishment of grouse. (B) Clear Cut
- Regenerate oak on the site. (C) Seed Tree or (I) Shelterwood
- Release crop trees not concerned with regeneration at this time. (G) Intermediate Thinning

Parts of a compass:

- white line on base plate - travel arrow
- letter "N" - index mark
- red arrow - orienting arrow
- bottom of compass - base plate or compass card
- 2-sided arrow in center - compass needle
- rotating ring - bezel (also: direction ring, degree dial, or Azimuth ring)
- center housing - capsule or compass housing

Explain the difference between azimuths and bearings with regard to compass readings. Azimuth is degrees only and bearings are cardinal direction (east, west, north-east, etc.) plus degrees.

How well do you know your Kentucky trees? Although these trees may be found in many parts of Kentucky, they prefer and thrive in particular areas. Match the following type of trees with the best definition of where they can be found: (sycamore, American beech, bur oak, bald cypress, chestnut oak, and Eastern redcedar)

- This tree thrives in western Kentucky bottomlands because it grows well in water-soaked, low-oxygen soils, and can actually grow out in the water. bald cypress
- This tree grows well in clay soil and open grassy areas. It is often planted in prairie grasslands. bur oak
- This tree likes wet soil and prefers the edges of streams, lakes, and the flood plains next to rivers. sycamore
- This tree is commonly found in the Appalachian region on dry soil and rocky ridges. chestnut oak
- This tree is among the first species to grow in old fields and pastures. They prefer full sun and are good at holding soil in place. Eastern redcedar
- This tree grows along the eastern and northern slopes of the Appalachian Mountains often in the shade of taller trees. American beech

Identify the following common forestry tools: diameter tape; Clinometer; shovel; fire swatter; axe; dibble bar; increment borer; prism; fire rake; Pulaski

On what kind of fire would you use a fire swatter? Grass

What is a prism used for? Measuring basal area

Trees are important in providing for humans and wildlife. List 5 foods that are produced in forests. Any fruit or nut was accepted, mushrooms

Identify the following points on the tree cookie/cross section. Provide the correct name of the part and its function. A tree cross section was provided and labeled. Cambium – Makes new cells; Heartwood – Provides strength to the tree; Xylem (sapwood) – Moves nutrients and water up the tree from the roots; Phloem – Moves food from the leaves to the rest of the tree; Bark – Provides protection to the tree.

Explain photosynthesis as it relates to the lifecycle of a tree? (Use a diagram and language to complete your answer) Photosynthesis requires the elements of sunlight, air, water, and nutrients. Tree roots absorb water and minerals and carry them to the leaves, where they come into contact with chlorophyll and air. Sunlight passes into a leaf, strikes the chlorophyll, and gives it energy to break water molecules apart. The hydrogen from a water molecule combines with carbon compounds from carbon dioxide, which comes from air. The resultant carbohydrates (starches and sugars) are the plant's food. The leaf releases oxygen from the broken water molecule through the process of transpiration.  $6\text{CO}_2 + 12\text{H}_2\text{O} \xrightarrow{\text{energy from sunlight}} \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 + 6\text{H}_2\text{O}$

Draw and label the life cycle of an oak tree. Seed, sprout, sapling, mature oak, dead tree (snag), rotting log

Choose 3 stages of the life cycle of an oak tree. What was the tree's role in the forest ecosystem at that stage?

Seed – new tree, food for animals

Sprout - food for animals, water transpiration, carbon storage, soil stabilization

Sapling - food for animals, water transpiration, carbon storage, soil stabilization

Mature oak - food for animals, water transpiration, carbon storage, soil stabilization

Dead tree – home for animals

Rotting log – nutrients, life for decomposers, green house gas release

List 2 different biotic factors and 2 different abiotic factors that are present in a Kentucky forest ecosystem.

Biotic factors: All plants and all animals

Abiotic factors: sun light, temperature, rainfall, climate, CO<sub>2</sub>, H<sub>2</sub>O, minerals and soil conditions.

Biomes are large regions of the world that have similar characteristics and are usually named for the dominant plant life in that area. List three terrestrial biomes: Tundra, Boreal Forests, coniferous forest, deciduous forest, grassland, savannah, desert, rainforest

Choose one of the biomes from #9 and predict three changes that would happen to the biotic portion of the biome if there were a dramatic change in temperature (increase or decrease) over a 500-year span.

Biomes are determined by temperature and precipitation. Any explanation of how a temperature change would affect living organisms in that biome would be acceptable. For example: Tundra –

- An increase in temperature would cause the ice to melt thereby causing polar bears to starve since they wait on the ice for seals to come up for air.
- An increase in temperature could cause a decline in native bird populations. The warmer temperature could allow invasive populations which would normally be deterred by the cold weather to move in.
- An increase in temperature may induce a longer growing season, thereby increasing caribou herds.

List the four major green house gases: CO<sub>2</sub> Carbon Dioxide; CH<sub>4</sub> Methane; N<sub>2</sub>O Nitrous Oxide; H<sub>2</sub>O water vapor

What 2 sources make up groundwater? Saturated zone and aquifer

Water is attracted to other water. This is called? A. adhesion; B. surface tension; C. cohesion; D. fatal attraction

Contaminants seeping underground from concentrated masses are called? A. pollution pathways; B. plumes; C. point-source pathways; D. concentrated contamination trails

Systems, activities, or structures that human beings can construct or practice to prevent nonpoint source pollution is called? A-Nonpoint Source Pollution Practices; B-Management System Practices; C-Farm Management Practices; **D-Best Management Practices**

What is a watershed? **An area of land that drains into a lake, river, stream, wetland, or other water body**

Groundwater is created and replenished by what? **Precipitation (water cycle is acceptable)**

**Less than 1%** percentage of the Earth's fresh water is groundwater.

Which of the following is an example of a best management practice? A. erosion; B. allowing cows and livestock to drink directly out of a stream; **C. planting grass or other plants on bare soil**; D. putting treetops in a creek for fish habitat

Since the spring of 2009, Kentucky has been infested with the Emerald Ash Borer (EAB). How does EAB kill ash trees? **The adult beetles nibble on ash foliage but cause little damage. The larvae (the immature stage) feed on the inner bark of ash trees, disrupting the tree's ability to transport water and nutrients (girdling).**

What is the best way to restrict the spread of EAB? **By not moving firewood**

What shape exit hole does the EAB adult leave when they emerge in the spring? **Δ shape; O shape; D shape; □ shape**

Streamside Management Zones are an important component of a good harvest plan developed to ensure that the natural resources are protected. What function/s does a SMZ provide? A. Allows for 70% of the timber to be harvested; B. Helps to increase the size of fish through management; C. Allows for the removal of steep banks so that equipment can cross a stream; **D. Filter sediments, fertilizers, and pesticides & protects shade areas.**

A landowner has a 14 acre mixed hardwood tract that needs thinning. This is a south facing site, with an average slope of 35% and several drainages. Using Best Management Practices (BMPs) as guidelines, what are 4 pre-harvest preparations that should be considered by the landowner? **Minimize soil erosion from roads and trails by installing water bars, culverts, bridges and road grading; Limit disturbance in SMZs; Identify sinkholes to minimize nonpoint source pollutants from flowing into sinkholes; Determine the amount of seeding and fertilizer that will be needed to reestablish grass on trails and roads after harvest is completed; Identify wetland areas.**

Coldwater Aquatic Habitats (CAHs) should have a minimum of **75%** of the original tree overstory retained within the **60** foot-wide strip on either side of the stream to provide shade.

During a timber harvest, what is the minimum percent of the overstory trees that should be left to shade perennial streams, ponds, and sloughs? **50 %**

What is an intermittent stream? **A stream that only flows during the wet portions of the year and in response to rain events.**

You have finished a logging job and are retiring the skid trails. The skid trails have a 15% slope. What is the spacing (slope distance in feet) that is recommended between water bars? **58 feet**. If the skid trail is 1160 feet long, how many water bars will you need **20**?