Total Station

# 2010 Missouri Envirothon
# Wildlife Ecostation

Team #

1. List 2 types of conservation practices or techniques that could help protect the health of the river at this site? (4 pts)

- Widen the riparian forest buffer by planting an additional row of trees and shrubs to make a buffer width of at least 25 feet.
- Adjacent to the forest buffer, plant a warm season grass buffer or filter strip of at least 25-30 feet in width to help slow soil erosion and nutrient/ chemical runoff from the above fields.
- Convert the fescue and broomsedge grasses upright warm season grasses.

2. Your goal is to transform a fescue dominated old field into a wildlife friendly stand of native warm season grass. What management techniques would you use to accomplish this and when (what time of year) would you apply those management techniques?
(3 points)

*Possible Options (could be more):*
*Option 1)*
*A fall herbicide application followed with another application in the spring to eradicate undesirable cool-season grasses before planting is usually sufficient for simple conversions.*
*Option 2)*
**In early May burn, graze, hay or mow the field to reduce the amount of undesirable cool-season grass seed produced.*
**In August burn, graze, hay or mow the field again before the fall herbicide application to improve herbicide effectiveness.*
**Spray a broad spectrum herbicide at the labeled rate in September through November when the cool-season grasses are 6 to 10 inches tall and actively growing.*
**Spray the following spring - April or May with a broad-spectrum herbicide at the labeled rate to eradicate any remaining undesirable vegetation. Vegetation should be at least 6 inches tall and actively growing.*
** Seed the field during the spring seeding dates*
*Option 3)*
**In March or April burn, graze, hay or mow the field to remove the residual vegetation.*
**Spray the field before planting with a broad-spectrum herbicide*
**Crop the field for one or two years, doing so will eliminate most of the undesirable vegetation.*
**After the final harvest:*
**Spray the field with a broad spectrum herbicide in late October through November. In December or early January, seed the field with native grasses and forbs*
*OR*
** If planting native warm-season grasses, legumes and forbs in the spring, delay the final herbicide application until April or May before seeding.*

3. Provide 3 reasons why it is beneficial to wildlife to retain downed woody debris. (3 points)

- *Provides nesting, hiding cover for birds, mammals, reptiles, and amphibian species*
- *Provides habitat for insects and detritus on which other wildlife feeds on.*
- *Downed wood is a preferred growing medium for various species of bryophytes, lichens, and fungi.*
- *Rotting wood found on the forest floor and later integrated in the soil surface layer by decomposition provides seedbeds for a variety of tree, shrub, and herbaceous species as well a rooting medium that retains moisture during dry periods.*

4. Provide 2 ways to improve this site for bobwhite quail, rabbits and pollinators. (4 pts)

- *Convert the fescue grass to wildlife friendly warm season grasses such as little bluestem, sideoats grama, and forbs.*
- *To create early successional habitat, conduct management techniques such as strip disking or prescribed burning.*
- *Create brush by planting or maintaining shrubs and vines such as blackberry, flowering dogwood, service berry, aromatic sumac, false indigo etc.*
- *Create downed tree structures by edge feathering a few of the trees along the river and/or distribute downed tree structures ("brush piles") throughout grassland fields.*

5. To encourage and stimulate the growth of forbs in a thick, native warm season grass stand, what time of the year should you apply a prescribed burn? (2 points)

a. Spring (April- May)
b. Summer (June-August)
c. *Fall (September – November)*
d. Winter ( January – March)
e. Burning does not stimulate forb growth

6. Name and describe the 3 essential habitat components for bobwhite quail and the percentage of each component that is needed in a home range. (9 pts)

- ***Nesting Cover –*** *Diverse grasslands with clump-type grasses that have last year's grass growth available for nest construction. A home range should contain at least 30% nesting cover.*
- ***Brood Habitat –*** *Area that mainly consists of forbs/legumes/annual weeds with at least 25-50% bare ground. About 40% of a home range should contain brood habitat.*
- ***Covey Headquarters -*** *Woody shrubs, low-growing stemmy trees, (or down tree structures, feathered edge, etc) that create a protective overhead canopy. The area underneath needs to be free of thick vegetation to allow movement. Headquarters at a minimum should be 30 feet wide by 50 feet long, or 1,500 square feet. Covey headquarters should make up 10 to 25% of a home range.*

7. List 3 ways a non-native species could be introduced into a new habitat. (3 points)

- *Purposely shipped into country*
- *Accidently included in plant materials or not cleaned out of used planting gear*
- *Windblown seeds*
- *Birds and other animals serve as transport*
- *Water movement*
- *Using a mower on different fields/areas without cleaning the cut grass out between fields.*
- *Not cleaning boats between using them in different water bodies.*

8. Using the provided deer jaw, estimate the age of this deer. (3 points)

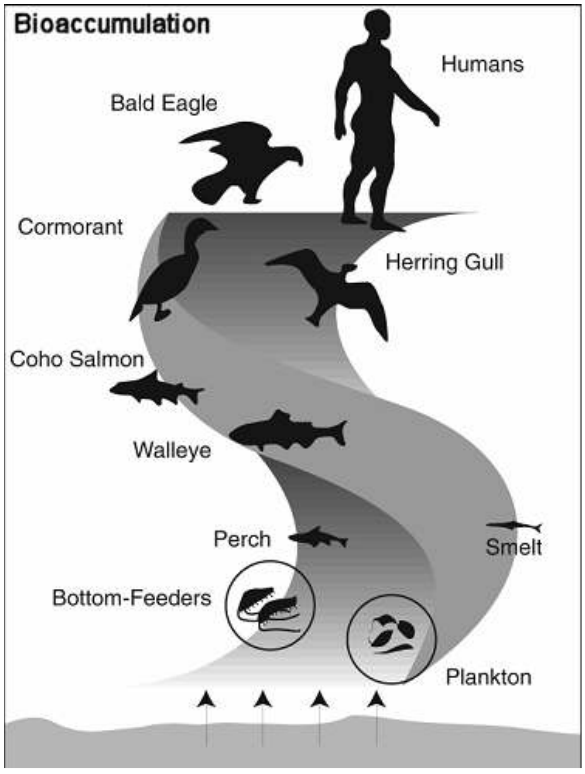
a. 1 ½ years
b. 2 ½ years
c. 3 ½ years
d. 4 ½ years
e. 5 years or older

9. Using the below options, identify the 3 grasses. (6 points)

a. Broomsedge
b. Little Bluestem
c. Indiangrass
d. Big Bluestem
e. Switchgrass
f. Fescue

1) Big bluestem
2) Indiangrass
3) Little Bluestem

10. Explain the significance of the illustration below. (3 points)




*Bioaccumulation is a term used to describe the uptake and retention of chemical contaminants which aquatic plants and animals obtain from food, water or sediments. At each step of the food chain the toxic contaminant is bioconcentrated. (actually10x at each step)*

Team #

1. List two examples of things you could do during a timber harvest that would create or maintain wildlife habitat. (4 points)

   - *Retain active den and snag trees.*
   - *Create forest openings*
   - *Leave mast producers standing*

2. Define "forest fragmentation" and provide 2 examples of how forest fragmentation can be detrimental to wildlife. (6 points)

   *Forest Fragmentation: the breaking up of larger forest blocks into smaller, disconnected patches.*
   - *Decline of forest dependent wildlife species requiring large continuous blocks of forest*
   - *Introduction of aggressive opportunistic species like brown-headed cowbirds which thrive on forests edges*
   - *Fragmentation can cut off migration corridors*
   - *Increased forest vulnerability to insects and diseases*

3. List 3 reasons why continuous grazing in forest habitat is detrimental. (3 points)

   - *Eliminates understory vegetation that provides food and cover*
   - *Damages mature trees*
   - *Results in soil compaction*
   - *Causes soil erosion*

4. List 2 ways that you could create or maintain pollinator habitat in a forest setting. (2 points)

   - *Leave standing or fallen dead trees*
   - *Plant or promote flowering trees and shrubs*

**Forestry** Page Total

1. Provide 2 examples of how trees and shrubs along streambanks benefit aquatic [ ] on nts)

   - *Helps with temperature control of water (shading)*
   - *Fallen twigs/branches provide structure and protective cover within the stream.*
   - *Leaf drop influences chemical composition and oxygen levels of water.*

2. Missouri amphibians and reptiles prefer: (2 points)

   *a. Moist soils covered with leaf litter*
   b. Well-drained, dry soils
   c. Shallow, rocky soils with minimum vegetation
   d. Shallow (less than 8 inches) ponds
   e. Both B & C

3. Place all of these animals in an ascending food chain. (6 points)

| | |
|---|---|
| a. Green Sunfish | *1 - Phytoplankton* |
| b. Phytoplankton | *2- Caddis Fly* |
| c. Bullfrog | *3- Bullfrog* |
| d. Raccoon | *4- Green Sunfish* |
| e. Caddis Fly | *5- Raccoon* |
| f. Bobcat | *6- Bobcat* |

4. Turtles are divided into which groups. (Circle 3 – all must be correct) (3 points or 0 points)

   a. Soft-shelled terrestrial turtles
   *b. Soft-shelled aquatic turtles*
   c. Soft-shelled carnivorous turtles

d. *Hard-shelled terrestrial turtles*
e. *Hard-shelled aquatic turtles*
f. Hard-shelled carnivorous turtles
g. Unshelled aquatic turtles

1 Your goal is to choose the proper location on the landscape for a prairies restor W Page Total portant to **Aquatics** find out what types of soils are found at the restoration site? (4 points)

- *You need to make sure that the soils are able to support prairie vegetation species. For example, for prairie restoration, deep, fertile soils are needed to support the extensive root systems of warm-season grasses (vs. shallow rocky soils).*
- **You need to make sure the soils have the proper hydric properties. For example, soils that hold too much water or flood frequently will not support prairie grasses.*

2. What 3 criteria must be present in order for an area to be considered a wetland by a wetland scientist? (6 points)

- *Predominance of hydric soils (soils formed under wet conditions).*
- *Prevalence of hydrophytic vegetation (vegetation adapted to wet soil conditions)*
- *Inundation or saturation by surface or groundwater (hydrology) enough to support hydrophytic vegetation.*

3. Planting a variety of trees and shrubs along stream banks will stabilize soils and reduce erosion. How does this protection of soil benefit wildlife? (3 points)

*Vegetation grows right down to the water edge providing cover for all animals using the stream, diversity of plants provides for a diversity of wildlife, keeping sediment out of the stream increases aquatic life and diversity and provides feeding source for more wildlife species.*

5. Planting legumes into a cool season pasture adds diversity for wildlife. Which nutrient that is utilized by the grasses is fixed in the soil by legumes? (2 points)

*Nitrogen*

**Soils**

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t 3 wetland habitat functions. (3 points)

- *Improving water quality*
- *Flood control*
- *Sediment control*
- *Nutrient recycling*
- *Maintaining critical wildlife habitat*
- *Recharging groundwater*

2. How does planting native grasses and flowers in an urban setting help conserve water? (4 points)

*Native species are adapted to MO's annual rain fall amounts and temperatures so they can withstand our hot summers without requiring as much water as introduced species; so they require much less watering by hand. Their root systems are also often much more extensive than introduced species which means they can access water much father down in the soil profile.*

3. Some of the most diverse and most vulnerable species of wildlife are found in ecosystems that rely directly or indirectly on groundwater for their survival. Such ecosystems are called **groundwater dependent ecosystems** (GDEs). The term GDE can potentially include wetlands, vegetation, river base flows, cave ecosystems, and springs. Why are groundwater dependent ecosystems important to protect? (8 points)

- *some are rare or unique and home to threatened species*
- *the ecosystems surviving in aquifers and caves may be amongst the oldest surviving on earth – e.g. invertebrates in caves*
- *they have water quality benefits – micro fauna in groundwater help 'clean up' contaminants*
- *they have biodiversity value - many species do not live in surface water habitats*
- *they add to the ecological diversity of a region*
- *they can be bio-indicators, (i.e. indicators of biological health of an overall system)*
- *they are connected to other non-groundwater dependent ecosystems and thus integrated into the broader regional environment*
- *sites may have cultural significance especially for indigenous people*
- *they can have social and economic values (e.g. recreation and tourism)*

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