

Meaningful Watershed  
Educational Experience

North Side

Student Journal

Name \_\_\_\_\_



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**Hanover-Caroline Soil & Water Conservation District**

in cooperation with

Hanover County Public Schools and Caroline County Public Schools

## Benthic Macroinvertebrate – Field Data Card

Organism's Name:

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Microhabitat: *(location found, if known)*

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Special Features/Adaptations:

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Feeding Group: *(i.e. shredder, grazer, collector, if known)*

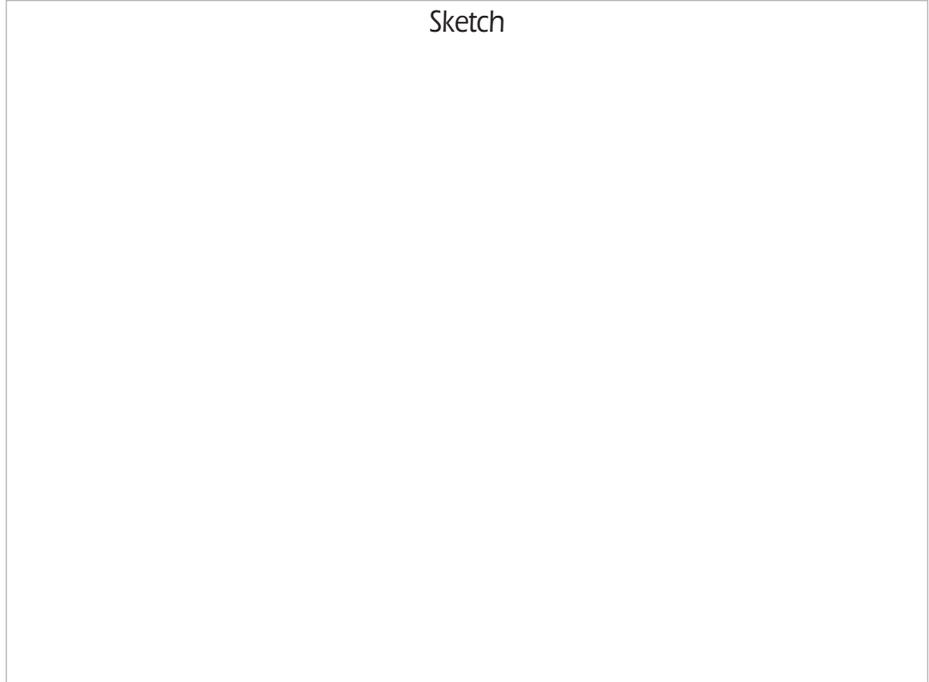
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Water Pollution Tolerance Level:

*(Group I – Intolerant, Group II – Moderately Tolerant, Group III – Tolerant)*

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Sketch



# Student Water Quality Testing Data Card

Team member names \_\_\_\_\_  
\_\_\_\_\_

## pH, Dissolved Oxygen (DO) and Temperature

**Temperature:** \_\_\_\_\_ °C

In general does the temperature seems exceedingly hot or cold for this time of year and place? If so, what might be causing the temperature change?

**DO:** \_\_\_\_\_ ppm      \_\_\_\_\_ % of saturation

Is the level of DO appropriate for supporting aquatic life? If not, what might be affecting the level of DO?

**pH:** \_\_\_\_\_

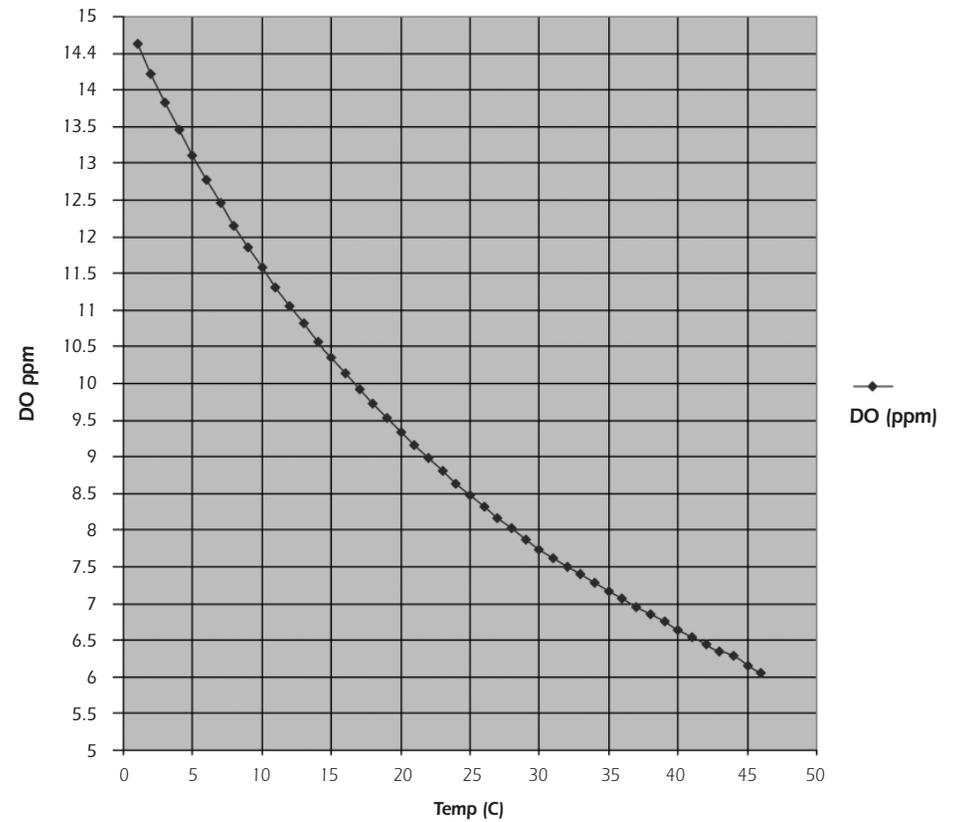
Is the pH of the water in the appropriate range for aquatic life? If not, is the water too acidic or too basic? Is there any evidence of what might be changing the pH?

Based on the results of the three tests do you think this is a healthy stream that adequately supports aquatic life? Why or why not?

How can we protect streams and rivers so they have appropriate levels of DO, pH and temperatures?

Why is it important to protect streams and rivers?

Max DO Levels to Temperature According to EPA Standards



## Riparian Buffer Data Card

Team member names \_\_\_\_\_

**What are the land uses uphill of this riparian area? (check all that apply)**

Crop Land     Field/Pasture     Residential     Special Events  
 Pave Parking Lot     Forestry     Commercial

**How wide do you estimate this vegetated buffer to be? (on this side of the river)**

0 to 25 ft.     25 to 50 ft.     50 to 75 ft.     over 100 ft.

**What is the relative slope of this area?**

Very Steep     Steep     Moderately Flat     Flat

**Compared to other forests you have walked in, how deep is the leaf litter/surface organic layer?**

Very Thick     Thick     Moderately Thin     Very Thin or Sparse

**How many areas of significant erosion do you see?**

Several     A Few     Next to None

**Do you see evidence of channeling, where water has flowed across the buffer in little streams, that are getting deeper?**

Yes, a lot     A little     None at all

**Do you see evidence of the buffer trapping sediment before it enters the river or sediment being dropped by the river when it floods?**

Yes, a lot     A little     None at all

**Based on what you can see, how well do you think this riparian buffer protects the river from non-point pollution?**

Very Well     Moderately Well     Not Well

Your assigned tree's letter \_\_\_\_\_

What species is your tree? \_\_\_\_\_

## Find the Culprit!

Local foresters are seeking your help in apprehending a tree that has escaped from captivity! It's a native of China, and it arrived here many years ago, posing as a pretty ornamental tree for cities and yards. It's now wanted on charges of outcompeting native trees and taking over their habitat, without even providing any decent food to wildlife. This tree is armed and dangerous – to other trees, that is. It produces a chemical that can keep other trees from growing nearby. It's also stinky!

This tree goes by the name *Ailanthus altissima*; alias: Tree-of-Heaven. We've reason to believe this tree is lurking here at this very site, waiting to infiltrate the forest. See if you can find one, based on this description.

- Alternate, compound leaves.
- Up to 25 leaflets on a leaf that may be several feet long!
- Smooth gray bark that may look a little like the skin of a cantaloupe.
- Big clusters of papery beige or pinkish seeds on female trees.
- Can reach 80 feet tall, but there may be some young ones growing nearby.
- If you break off and crush a leaflet, it smells bad.

## Identification Key to Some Common Riparian Trees

Locate your assigned tree amongst those that are flagged. Start at number 1 on the key. Read both choices, and follow the directions based on your choice. When you reach a **name**, you have identified the tree! Enter the information on your team's student data card.

1. Tree has leaves → Go to 2, or  
Tree has needles → Go to 3
2. Leaves are opposite (straight across from each other) → Go to 4, or  
Leaves are alternate (not straight across from each other) → Go to 7
3. Needles are short and in bunches of two → **Virginia pine**, or  
Needles are long and in bunches of 3 → **Loblolly pine**
4. Leaves are compound (divided into parts) → Go to 5  
Leaves are simple (having only one part) → Go to 6
5. Most leaves have 3 to 5 leaflets → **Boxelder**, or  
Most leaves have 7 to 9 leaflets → **Green ash**
6. Leaves have finely toothed edges and 3 to 5 main lobes → **Red maple**  
Leaves are oval, with smooth edges → **Flowering dogwood**
7. Leaves are compound (divided into parts) → Go to 8, or  
Leaves are simple (having only one part) → Go to 10
8. Leaflets are rounded leaflets; there may be "pods" on tree → **Black locust**  
Leaflets are pointed; there may be nuts on the tree → Go to 9
9. Leaves have 10 to 24 pointed leaflets; nuts are larger than a golf ball → **Black walnut**, or  
Leaves have 5 to 9 leaflets; nuts are smaller than a golf ball → a **Hickory** species
10. Leaves may be oval, mitten-shaped, or 3-lobed → **Sassafras**, or  
All leaves are the same shape → Go to 11
11. Leaves are somewhat triangular, with toothed edges; bark is ragged and peeling → **River birch**, or  
Leaves are some shape other than triangular → Go to 12
12. Leaves are narrow (less than 2 cm wide) and pointed → **Black willow**, or  
Leaves are some other shape → Go to 13
13. Leaves are evergreen, thick, shiny, with sharp spines → **American holly**, or  
Leaves are not evergreen or spiny → Go to 14
14. Leaves are oval, smooth edged, 7 to 11 inches long;  
tree is fairly small → **Pawpaw**, or  
Leaves are lobed, with wavy or toothed edges → Go to 15
15. Leaves have wavy, rounded lobes; acorns may be present; bark is pale and shaggy → **Swamp Chestnut Oak**, or  
Leaves have several main lobes or points → Go to 16
16. Leaves have 4 to 6 pointed lobes and smooth edges → **Yellow-poplar**, or  
Leaves have 3 to 5 main points and ragged edges; bark is a mixture of brown, gray, and white near the top, with some peeling areas → **Sycamore**

## Field Notes Station: Is There Still Room for Wildlife?

Team member names \_\_\_\_\_  
\_\_\_\_\_

*This activity should be conducted at the schoolyard either before or after the field trip to the fairgrounds, so the two sites can be compared.*

### Directions

Your adult chaperone will instruct you on whether your teacher would like you to complete this exercise individually or in consultation with your team members (the small groups you have been assigned to for the day.)

Both social and natural scientists rely on their senses to make field observations. At this station, you are asked to use your observation skills to record information and evaluate this site's ability to provide wildlife habitat. Habitat is the arrangement of food, water, shelter and space suitable for animals' needs. Different wildlife species have different habitat requirements. The eastern cottontail gets most of the water it needs from its food source, but a whitetail deer needs to drink where water is on the surface of the ground. While completing this habitat evaluation process, assume that the goal is to have a wide variety of mammals, birds, amphibians, reptiles, fish and insects present on the property.

To complete the habitat evaluation, rate each component on a scale of 1 (lowest or not present) to 5 (highest – abundant). Circle your responses. You will need to imagine the site during each season of the year. At the end of each section, calculate the average score for that section and list any suggestions for improvement you can make. For example, if you think the area lacks food for birds and other wildlife, a suggestion would be to plant shrubs that provide berries and nut trees.

### A. Food Sources

Nuts	1	2	3	4	5
Seeds	1	2	3	4	5
Berries	1	2	3	4	5
Nectar	1	2	3	4	5
Insects	1	2	3	4	5

A. **Average Food Score:** \_\_\_\_\_

Ways to Improve:

### B. Water

Green leafy plants with high water content	1	2	3	4	5
A wet area present all year	1	2	3	4	5
A wet area present part of the year	1	2	3	4	5

B. **Average Water Score:** \_\_\_\_\_

Ways to Improve:

### C. Shelter

Thick brush and brambles	1	2	3	4	5
Tall grassy fields	1	2	3	4	5
Woodlands with many layers of plants	1	2	3	4	5
Streams with forested buffers	1	2	3	4	5
Dead standing trees	1	2	3	4	5
Rotting logs on the ground	1	2	3	4	5
Brush piles	1	2	3	4	5

C. **Average Shelter Score:** \_\_\_\_\_

Ways to Improve:

### D. Space (natural habitats of adequate size)

Meadows	1	2	3	4	5
Forests	1	2	3	4	5
Shrubs	1	2	3	4	5
Wetlands	1	2	3	4	5
Streams	1	2	3	4	5

D. **Average Space Score:** \_\_\_\_\_

Ways to Improve:

**Overall Score:** (A+B+C+D divided by 4) \_\_\_\_\_

## Field Notes Station: A Sense of Place

Team member names \_\_\_\_\_  
\_\_\_\_\_

### Directions

Your adult chaperone will instruct you on whether your teacher would like you to complete this exercise individually or in consultation with your team members (the small groups you have been assigned to for the day.)

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### Background for Reflection

All scientists rely on their senses to make field observations. At this station, you are asked to use your observation skills to record information about what you are experiencing today. The landscape you see today is the result of natural events and human activities spread over a long period of time. For the purposes of this exercise, we will think of the Meadow as having three main historical periods or eras:

1. wilderness – before European settlement,
2. farm (recent past) and
3. its future as a special event venue.

Being located between Richmond and Washington D.C., this region has been a transportation corridor since colonial days. The town of Doswell has served as a rail station for over 150 years, playing a role in the transportation of people, agricultural and forest products. In 1864, both the Confederate and Union armies moved in and out of this area in their effort to take and defend Richmond. The Battle of North Anna was fought just a few miles away. For nearly 50 years, Interstate 95 has contributed to the sights and sounds of this landscape.

From colonial days through the 1970s, Caroline County was known for its horse farms. Triple Crown winner, Secretariat, perhaps the most famous of race horses, was born and started his training here at Meadow Farm. Today, the Meadow is the home of the State Fair of Virginia and several other special events held throughout the year. Reflect on what you think has changed and what has remained the same, during these time periods, as you complete the following observations:

The main plant communities I can see on this property are:

Do you think these communities were present when the Meadows was a working farm, yes or no, and why or why not?

When it was a wilderness?

Can you tell you are near a river, yes or no, and why or why not?

Please list 3 changes you think were made to this property while converting it to a fairgrounds?

- 1.
- 2.
- 3.

What sounds do you hear today?

How do you think the sounds may differ if you were sitting here ...

In 1600?

In 1864?

In 1971?

When the State Fair is going on?

## Additional Notes

Reflect on the activities of nocturnal animals. What impact do you think the State Fair has on them?

Name two other environmental impacts the Fair may have on this natural site?

List two design elements you think were used to help lessen those impacts?

What other suggestions do you have for conserving natural resources?

How does this place make you feel?

