STREAM WALK SURVEY

Learning Objectives:

- Students will become aware of the plants and animals that live near the stream or river.
- Students will understand how the stream or river is being used by people.
- Students will understand how land uses affect river/stream water quality and streambank habitat.

Standards:

Agricultural Education: B.8.3, E.8.2; Environmental Education: A.8.4, A.8.5, A.8.6, A.12.5, B.8.5, B.8.10, B.8.17, B.8.18, C.8.2

Time:

A stream walk survey will take one afternoon (depending on the length of stream being surveyed).

Materials:

Stream Walk Worksheet (Pages 1-92 and 1-93)

Background:

Conducting a survey is the first way to collect information about your stream or river. From this survey, you will gain information to help you to decide what actions may be needed to improve the quality of the stream or river.

Use the Stream Walk Worksheet to evaluate the health of your waterway.

PROCEDURE:

1. Ask for permission to conduct a survey if the survey site is on private property.
2. Before going on your stream walk, make copies of the Stream Walk Worksheet for all members of the group. This worksheet will be your guide to completing the survey.
3. If you have a topographic map of the waterway, draw a circle around the area to be surveyed.
4. If storm drains or drainage pipes enter the stream, do your best to follow the pipes to find their sources.
5. Take pictures or a video of the stream or river to document your trip and the stream's quality.
6. Complete a new Stream Walk Worksheet for every survey done. Include photos and other information that you collect. Use this information to build a portfolio about your stream, or share the information with your community through media releases, newsletters, or displays at local malls, schools, banks, etc.

How to Complete the Form:

Complete the box that asks for information about the name of the stream, where it is located, and the date and time that you collected the data. In the weather section, check the box that best describes the weather conditions.

1. Water Appearance is a physical indicator of water pollution. Select the term(s) that best describe the physical appearance of the water in the stream:

   Clear: Colorless, transparent.

   Turbid: Cloudy brown. May be due to silt or plant material suspended in the water.

   Milky: Cloudy-white or gray. May be natural or due to pollution.

   Foamy: May be natural or caused by excessive nutrients or detergents from pollution. (Foam that is several inches high and does not brush apart easily is generally due to some sort of pollution.)

   Dark Brown: Tea-colored. May indicate that acids are being released into the stream due to decaying plants.

   Oily Sheen: A multi-colored reflection. Can occur naturally or it may indicate oil or other petrochemicals in the stream.

   Orange/Reddish: May indicate acids draining into the water or iron bacteria.

   Green: Caused by algae. May indicate excess nutrients are being released into the stream.

2. Water Odor is also a physical indicator of water pollution.

   None: Indicates good water quality.

   Sewage: May indicate the release of human waste material, livestock manure flow from an upstream feed lot. If you smell sewage/manure or rotten eggs coming from stream, please do not enter the water. Notify the nearest DNR Service Center.

   Chlorine: May indicate that a sewage treatment plant is over-chlorinating its effluent or may be from swimming pool discharge. Also a component of milk house cleaning.

Fishy: May indicate the presence of excessive algal growth or dead fish.

Rotten Eggs: A sulfurous smell may indicate muck soils or sewage/manure pollution, as hydrogen sulfide gas is a product of organic decomposition.

Petroleum: May indicate an oil spill from boats, land or storm drains.

3. Temperature controls the growth/activity of bacteria which can strongly influence the amount of oxygen in the water. Cold water holds more dissolved oxygen than warm water, thus temperature directly affects the amount of oxygen available to these organisms.

    a. Measure air temperature by holding the thermometer in the shade for at least two minutes. If there is no tall vegetation, use your body to shade the thermometer. Repeat and record both measurements.

    b. Measure water temperature by submerging a thermometer for at least two minutes in a stream run. Do not measure temperature in a slow-moving part of the stream or right next to the banks. Repeat in another section of the stream and record both measurements.

4. Submerged Aquatic Plants. Record if there are submerged plants in the stream and describe what they look like and where they are located.

5. Riparian (streamside) vegetation and other riparian surfaces. Identify the riparian vegetation or other land covers by type. Use the left column for the left-hand side of the waterway (looking upstream); use the right column for the right-hand side.

6. Canopy Cover. Estimate how shaded your site is. Do not include overhanging grasses. Check the box that is closest to your estimate.

7. Bottom Substrate is the material in and on the stream bottom that macroinvertebrates attach to, feed from or crawl on. Check the boxes that best describe the stream bottom in the study site.

8. Stream Discharge Estimate. To estimate the volume of water flowing through the stream at a particular point, measure the width, depth and average water velocity. You will need someone to help you with this measurement.

    a. Stream Width: Measure the width of the stream with a tape measure. If the stream is too deep, wide or polluted to measure directly, you might be able to measure the depth indirectly by using a bridge. Indicate on the data sheet that the measurement was an estimate.

    b. Stream Depth: Record the stream depth at five evenly distributed points across the channel. Total the five depth values and divide by five to determine the average depth in feet.

    c. Stream Velocity:

        i. Mark off a distance of 20 feet of stream at your site. Place a person in the water or on the bank at the "top" spot and the other person 20 feet downstream at the end of the measured length of stream.

        ii. Have the downstream person be the time keeper with a stopwatch.

Note to teachers:

If you are conducting the field trip, students will complete the Stream Discharge Estimate at that time, so you may opt to skip this step during your stream walk survey.

iii. The person at the "top" spot should gently toss an orange, apple or other float at least five feet upstream from the "top" spot. Once the object passes the "top" person, that person should yell "start" to begin timing how long it takes the object to float 20 feet.

iv. When the object passes the "downstream" person, that person should yell "time" and stop the watch. Don't forget to retrieve the object for a few more trials.

v. Record the time in seconds in the appropriate space on the Stream Walk Worksheet.

vi. Repeat this procedure two more times. Try to place the float in different places across the channel. Do not count any trials where the float gets stuck in debris, along the bank or in an eddy.

vii. Keep track of the type of float used. Notes on floats: Oranges and apples seem to work very well. Many groups use tennis balls. Vials half full of water, corks and even sticks have been used as well. The type of float used should be consistent. Do not use something that can be affected by the wind. Many people like to use something that is biodegradable.

viii. Total the three trial times and divide by three to determine the average time.

ix. Divide this number into 20 to get the velocity (feet/second). For example if the three times it took your orange to travel 20 feet were 16, 9, and 11 seconds. The average time equals 36 divided by 3 = 12 sec. To get the final velocity divide 20 feet by 12 seconds = 1.67 feet/sec.

d. Stream Discharge: Multiply the width by the average depth by the velocity to get the discharge.

9) Watershed Features. Record all land uses observed upstream of your site for about ¼ mile. Indicate which land uses are present with a check in the first column. If the land use is clearly having an impact on the stream, check the second column.

10) Channel Alteration. Indicate whether or not the stream segment has been channelized or straightened.

11) Personal Observations. Enter here any observations that you feel are important to the quality of the habitat of the stream and its environs. Include any characteristics not mentioned on the data sheet.