

Habitat Assessment

Chicago-Calumet River Field Trip Activity

Summary

Students answer a series of quantitative and qualitative questions to gage the quality of river and river edge habitat. Data can be used to interpret results from chemical and biological water quality monitoring.

Background

The habitat assessment form looks at a variety of factors. Below is an explanation of why we look at these factors.

Weather

Current and past weather conditions greatly affect the condition of the river. If it has rained in the last couple days you can expect the river to be much higher and to be running much faster. With lots of fast running water, the river has more power and will erode its banks, leading to increased turbidity. Also, after rain storms street drains in the northern portion of the watershed will be emptying into the river and in the south there is the potential for combined sewer overflows. (Combined sewer overflows are when storm and raw sewage reaches the river because the sewage treatment plants are overwhelmed by the quantity of water reaching them.)

Water Appearance

Though not all pollution is visible, the appearance of the river can give us hints as to potential pollution issues.

- Clear: good
- Milky: some sediment suspended in the water
- Foamy: soaps in the water
- Dark Brown: lots of sediment in the water
- Oily Sheen: oil in the water
- Reddish: high mineral content or dye
- Green: lots of aquatic growth

Grade Level: 6th – 12th

Duration: 30-40 minutes

Objectives:

1. Students develop observation skills.
2. Students apply ecological understanding in assessing the quality of the environment.

Materials:

- ◆ Copies of habitat assessment form (1 per group).
- ◆ A clipboard and pencil

Standards:

11.A.3c, 11.A.4c

NGSS:

MS-ETS1-3, HS-ETS1-2

Water Odor

Though not all pollution has an odor, the smell of the river can clue us in to potential pollution issues.

- None: good
- Sewage: there has been a combined sewer overflow or there is a leak
- Chlorine: can indicate treated sewage (though sewage in the Chicago region is no longer chlorinated)
- Fishy: presence of dead fish may indicate pollution problem
- Rotten eggs: bottom of river is anaerobic, may indicate eutrophication and excessive decomposition.
- Petroleum: oil or gas present

Physical Characteristics

Physical characteristics help us understand how humanly modified the channel is and what kind of habitat may be available. Meandering, braided and streams with pools and riffles usually have a wider variety of higher quality habitat.

Canopy Cover

Trees help shade the river and prevent high temperatures in the summer months. To estimate canopy cover, assume branches are full of green leaves and estimate what percentage of the river would be covered with leaves. Using shadows over the river is inaccurate because shadow coverage will change with time of day.

Bank and Riparian Vegetation

Vegetation helps stabilize the banks and prevent or reduce erosion. They also provide habitat for many animals that depend on the river.

Available Stream Habitat

Noting the variety of habitat helps us assess the quality of habitat available and the variety of plants and animals that may be able to live in that section of the river.

Bank Erosion

The greater the amount of bare soil and the steeper the slope, the more erosion is likely to take place. Erosion not only destroys bank habitat but excess sediment in the stream increases the stream's turbidity (making it difficult for many plants and animals to live in the river) and leads to a more silty stream bottom (some animals can only live in more rocky bottoms).

Human Use

Some human use is beneficial, other harmful. This lets us assess how the area is being used.

Watershed

How healthy a river is depends not only on the conditions of the water itself, but on the quality of its watershed. Noting the land use in the watershed can give clues to potential problems facing the river.

Procedure

It can be helpful to review the habitat form before the field trip to ensure that students understand the terminology as well as the reasons for the different questions. For information on organizing a field trip to the river, check our website at www.chicagoriver.org/education and click on field trips.

At the river, students can work in pairs or small groups to fill out the habitat study. Since many of the answers to the questions are qualitative or based on estimates it is often interesting to have students compare their estimates and talk about the differences, how this impacts their results, and how qualitative or estimated data differs from measured data.

If students are also collecting water chemistry data or macroinvertebrate data, the habitat study can be very helpful when students try to interpret their other data. For instance, if macroinvertebrate diversity is low, the lack of stream bank vegetation, high levels of erosion or a very dark and murky water color may point to reasons why macroinvertebrate diversity is low.

Habitat Assessment Data Sheet

School Name: _____

Site Location: _____

Date: _____

Time: _____

Present Weather

- Clear/Sunny
- Overcast
- Intermittent Showers
- Steady Rain
- Heavy Rain or Thunderstorm

Weather in past 48 hours

- Clear/Sunny
- Overcast
- Intermittent Showers
- Steady Rain
- Heavy Rain or Thunderstorm

Water Odor

- None
- Sewage
- Chlorine
- Fishy
- Rotten Eggs
- Petroleum
- Other _____

Water Color

- Clear
- Milky
- Foamy
- Dark Brown
- Oily Sheen
- Reddish
- Green

Physical Characteristics

- Straight Meandering Braided Channelized Pool and riffle

Canopy Cover

- 0% 1-5% 6-25% 26-50% 51-75% 76-100%

Available Stream Habitat

Check all that are present:

- Pools and riffles
 Wetland
 Rocks
 Log piles
 Weed beds
 Undercut banks
 Human-made objects (pilings, concrete blocks, etc.)

Bank and Riparian Vegetation

If more than one is present, please record estimated percentages:

- Barren _____ %
 Grasses _____ %
 Brush _____ %
 Deciduous trees _____ %
 Conifers _____ %
 Other _____ %

Bank Erosion

Estimate percent bare soil: _____ %

Bank slope: Steep Moderate Slight

Bank stability: Stable Slightly eroded Moderately eroded Severely eroded

Human Use

Please check off all that apply:

- Biking
 Fishing
 Partying
 Hiking or nature walking
 Canoeing
 Restoration site

Watershed:

Record a "D" next to dominant land uses and an "X" next to those land uses that are minor.

<input type="checkbox"/>	Forest	<input type="checkbox"/>	Park	<input type="checkbox"/>	Scattered residential	<input type="checkbox"/>	Sewage treatment
<input type="checkbox"/>	Prairie or ungrazed fields	<input type="checkbox"/>	Golf course	<input type="checkbox"/>	Moderate density residential	<input type="checkbox"/>	Sanitary landfill
<input type="checkbox"/>	Wetland	<input type="checkbox"/>	Cropland	<input type="checkbox"/>	High density residential		
		<input type="checkbox"/>	Livestock pasture	<input type="checkbox"/>	Commercial		
				<input type="checkbox"/>	Industrial		

Site Map

Draw a 100-foot long section of the river. Make sure to include: compass rose (indicating north), a scale, key (if symbols are used), direction of river flow, location of pools & riffles, roads, bridges & paths, bank vegetation and areas of erosion. Also include information which identifies where you are along the river.

