



Name:

Date:

Worksheets - Grade 8 Weaselhead Freshwater Systems Program

Activity Title: Watershed Lookout

Time required: 10 Minutes

Leader: Naturalist

Materials needed: pencil and paper

Background: It is important for the students to have a feel for the look and shape of the watershed of the Elbow River as they will be learning about it. This program is based on understanding what a watershed is. Drawing and describing it will help students to understand the concept..

Direction

1. Looking out over the valley make a sketch of the watershed (the drainage basin) of the river

2. In a few sentences describe the Elbow River watershed. For example, how big is it, how long is the river? Is it a valley?

Activity Title: Water Quality Challenges

Time required: 10 minutes

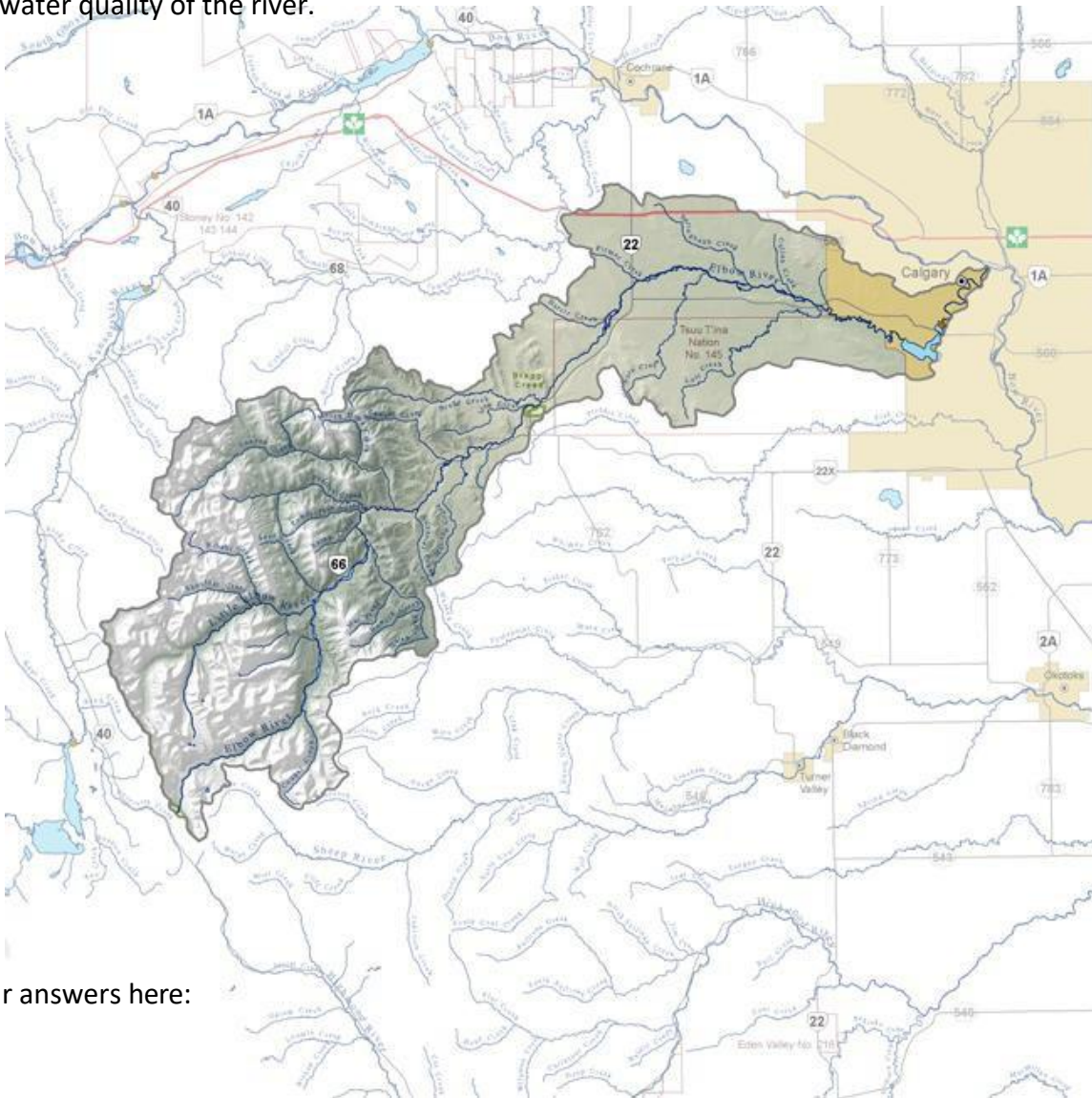
Leader: Naturalist

Materials needed: map of the Elbow River watershed (below) and pencil.

Background: This activity allows students to think about what features and activities within the watershed can impact water quality. Finding potential sources of natural and man-made pollution themselves will help the students to remember them and think about those things in the future. It also gives them experience looking at maps.

Directions:

1. Looking at the map of the Elbow River watershed below list the activities that may affect the water quality of the river.



List your answers here:

Activity Title: Elbow River Wildlife

~ PLEASE BE CAREFUL ALONG THE EDGE OF THE RIVER ~

Time required: 20 minutes

Leader: Naturalist

Materials needed: Pencil, workbook, observation skills!

Background: This will get students to practice their observation skills and will show them that there are other signs to look for than just the actual animal themselves - tracks, scat, noises etc.. It will also show them the importance of the Elbow River for various kinds of wildlife.

Directions:

1. Brainstorm a list of animals that can be found along the Elbow River. Remember to include birds (shore and water), mammals (large and small), amphibians and fish.
2. Can you observe or see any evidence of some of the animals in your list today? And if so, what can you see?
3. River valleys act as wildlife corridors. What will happen to wildlife as development increases along the Elbow River? How can we prevent or minimize the negative effects of development on wildlife?

Activity Title: Elbow River Flora

Time Required: 10 minutes

Leader: Naturalist

Materials needed: pencils, workbook, plant guides (provided)

Background: This activity encourages students to notice the great variety of plants that grow along the Elbow River. It is important for them to take note of the different plants and realize that they all play a role in the riparian ecosystem. It will also teach them the names of plants and to be observant.

Directions:

Examine the flora (plants) along the shore of the Elbow River. Draw and identify three plants observed.

Plant a)

Plant b)

Plant c):

Activity Title: Wetland Flora

Time Required: 30 minutes

Leader: Naturalist

Materials needed: pencils, workbook, plant guides (provided)

Background: This activity introduces students to the great variety of wetland plants in the Weaselhead. It emphasizes the importance of these plants and allows the students to identify them.

Directions:

Examine the flora (plants and algae) along the shore and in the water at each wetland. Draw and identify three plants (one on the shore, two in the water) observed at each wetland.

Site #1 Oxbow	Site #2 Beaver Lagoon
On the shore Name:	On the shore Name:
In the water Name:	In the water Name:
In the water Name:	In the water Name:

Question : Wetland plants act as natural filters because they can absorb excess nutrients and heavy metals. For example, marsh plants use nitrogen and phosphorus to grow, and cattails can absorb and store heavy metals such as lead. How can we use wetland plants to improve water quality?

Your answer:



Activity Title: Abiotic Water Quality Factors

Time Required: 45 min

Leader: Naturalist

Materials Needed: Workbook
Pencil
Water quality testing kits
Thermometer

Background: This activity shows students the different factors that influence water quality. It teaches them that there are many important abiotic factors that should be studied when examining water quality, including chemical and physical factors. It will also allow them to compare abiotic water quality factors with biotic ones (next activity).

Directions: Fill in this table with the help of the materials provided by the naturalist.

	Site #1 Oxbow	Site #2 Beaver Lagoon	Site #3 Elbow River
Turbidity: 0 - 10			
Water temperature: Surface (°C)			6°C
Middle (°C)			5°C
Bottom (°C)			4°C
Dissolved Oxygen (ppm)			7.5 ppm
pH			
Nitrate (ppm)			<2.5 mg/l
Nitrite (mg/l)			0 mg/l
Ammonia mg/l)			0 mg/l
Phosphate (ppm)			

Activity Title: Biotic Water Quality Indicators

Time Required: 45 min

Leader: Naturalist

Materials Needed: Nets

Containers

Pencils

(In this activity the Naturalists and helpers will catch the invertebrates so not too many will be taken).

Background: This activity shows students the importance of invertebrates and shows student that there are many forms of life in fresh water that most people are unaware of. It teaches them the importance of aquatic invertebrates as water quality indicators.

Directions:

1. Draw and identify 3 aquatic invertebrates observed at each wetland.

Site #1 Oxbow	Site # 2 Beaver Lagoon
Name:	Name:
Name:	Name:
Name:	Name:

Bioindicators

Aquatic invertebrates can be used as bioindicators. In general, species that are important bioindicators need high oxygen levels, neutral pH, cold water, and low levels of nitrates, nitrites, ammonia, heavy metals and other pollutants. Invertebrates that can survive low oxygen, warmer water, pH ranges outside of neutral and more pollution have a different physiology that is less sensitive to these factors or have special adaptations that allow them to cope, for example mosquito larvae have 'snorkels' that poke out of the water and allow them to breathe air.

Pollution tolerant	Somewhat Pollution Tolerant	Pollution Intolerant bioindicators
Midge larvae Backswimmers Water Boatmen Water Striders Leech Lunged Snails Mosquito larvae	Dragonfly nymph Damselfly nymph Crane fly larva Giant Water Bugs Beetles and beetle larva	Mayfly nymph Caddisfly larva Stonefly nymphs Gilled Snails Scuds

1. Which bioindicators did you see in the Oxbow?
2. Which bioindicators did you see in the Beaver Lagoon?
3. Further up the food chain in a healthy stream, what eats Mayfly nymphs and Caddisfly larvae?
4. Do the **biotic** water quality indicators seem to agree with the **abiotic** water quality tests that you measured today? Is there anything that did not match up?