Weaselhead/ Glenmore Park
PRESERVATION SOCIETY

Name:

Date:

## Worksheets - Grade 9 Biological Diversity and Environmental Water Chemistry

1. What is biodiversity? Why is biodiversity so important?

2. How do invasive plant species affect biodiversity?

3. What are the sources of the chemicals that influence water quality in the Elbow River? (It is 120 km in length and has a watershed of over 1,200 $km^2$ )

4. During your field-trip look for and identify three organisms living in symbiotic relationships:
   a. where each organism benefits the other (mutualism) ……
   b. where one organism benefits and the other is unaffected (commensalism) ……
   c. where one organism benefits and one looses in the relationship (parasitism) ……

**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 | Site # 2 |
|---|---|
| Name: | Name: |
| Name: | Name: |
| Name: | Name: |

**Bioindicators**

Aquatic invertebrates can be used as bioindicators. Aquatic invertebrates can be used as bioindicators. In general, total taxon diversity tends to be lower in polluted sites than in unpolluted sites. The abundance of pollution sensitive aquatic invertebrates such as mayfly and caddisfly larvae are greatly reduced in polluted water.

| **Pollution tolerant** | **Somewhat Pollution Tolerant** | **Pollution Intolerant bioindicators** |
|---|---|---|
| Midge larvae<br>Backswimmers<br>Water Boatmen<br>Water Striders<br>Leech<br>Lunged Snails<br>Mosquito larvae | Dragonfly nymph<br>Damselfly nymph<br>Cranefly larva<br>Giant Water Bugs<br>Beetles and beetle larva | Mayfly nymph<br>Caddisfly larva<br>Stonefly nymphs<br>Gilled Snails<br>Scuds |

1. Do the biological water quality indicators concur with the abiotic water quality indicators?

2. List several Bio-Indicator Species found on your field trip. Note what environmental quality they indicate from their presence or absence.