



# Recreational Impacts on Natural Areas

Weaselhead Field Trip Student Worksheets

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Program Developed with Thanks to Alberta Ecotrust



## Soil Erosion and Compaction

Materials: Pencil, Water bottle

Procedures: Several illegal paths can be found in various locations of the Weaselhead. Students will study the compaction of these trails.

1. Using a pencil measure the soil compaction poking it into the soil profile on the path. As your control to compare your measurement to, poke the pencil into an area with no trail disturbance. Measure and record how easy the pencil enters the soil on the trail as Easy, Medium, Hard.
2. Pour a small amount of water onto the illegal trail and measure the level of absorption. If the water just runs down the trail with little absorption record it as Low, if some water absorbs record as Medium, and if most of the water is absorbed into the soil record it as High. You may pour some water on the surrounding vegetation for a control to compare against. Or measure the amount of time and distance the water travels.
3. Observe and record Plant Diversity on the path as Low, Medium, High. Count and record the number of species found in a hand plot sample (Hand Plot: Using your hands make a square with your index finger and thumbs to measure a consistent area throughout the days studies).
4. Record any additional comments regarding the impact of these trails. For example, note if you find signs of bike tracks.
5. Record any ideas for mitigation (Mitigate: To reduce or minimize potential impacts), Discuss how Soil Compaction effects your group (Soil, Water, Vegetation, Wildlife)

## **Soil Compaction Chart**

<b>Location</b>	<b>Soil Compaction</b> Easy or Medium or Hard	<b>Water</b> <b>Absorption</b> Low, Medium, High (or time & distance)	<b>Plant Diversity</b> Low, Medium, High	<b>Comments</b>
Top Escarpment				
Aspen Stand				
Benches				
Other				

<b>Mitigation</b>	<b>Discussion of effects on your group</b>



**Plant Diversity**

Materials: Hoop to measure consistently throughout ecosystems. Plant Identification Books & Keys.

Procedures: Lay hoops in locations designated by Naturalist. Count and record the different amount of plant species observed. Note the amount of non-native invasive plants discovered. Discuss how plant diversity affects your group.

**Plant Diversity Chart**

<b>Ecosystem</b>	<b>Plant Diversity (amount of species)</b>	<b>Non-Native Invasive Plants (amount of species)</b>	<b>Comments</b>
Grassland			
Aspen Stand			
Riverine Forest			
Tall Shrub			
Spruce Grove			

How does plant diversity affect your group?

Compare plant diversity in areas with non-native invasive plants to natural plant areas.



**Water Quality**

Materials: Water Quality Measurement Kits

Procedure: Follow the instructions for your group's water quality measurement. Record results in the table below. Share and discuss results with the class, record the results at this time from the other groups. Record ideas for mitigation and discuss how Water Quality affects your group.

**Water Quality Chart**

	<b>Elbow River</b>	<b>Comments</b>
<b>Turbidity</b> (JTU)		
<b>pH</b>		
<b>Water temperature:</b>		
Surface (°C)		
Middle (°C)		
Bottom (°C)		
<b>Dissolved Oxygen</b> (ppm)		
<b>Nitrate</b> (mg/l)		
<b>Nitrite</b> (mg/l)		

<b>Mitigation</b>	<b>Discussion of effects on your group</b>

List some Aquatic invertebrates that act as Bioindicator species of Water Quality:



### **Wildlife Observations**

**Procedure:** Record the signs of different wildlife and bird species. You may see the species, or see signs of their activity such as tracks, scat or den sites (nests, lodges etc.) Comment on how recreational activity may affect the species. Record ideas for mitigation and discuss how wildlife presence affects your group.

### **Wildlife Chart**

<b>Species</b>	<b>Comments</b>

<b>Mitigation</b>	<b>Discussion of effects on your group</b>

### **Invertebrate Study**

**Materials:** Plastic tub, plastic containers, white sheet

**Procedure:** Collect leaf litter at the base of a native plant shrub and non-native plant shrub and count the amount of invertebrates found. Count the invertebrates found on the shrub. Shake the shrub with a white sheet under it to observe invertebrates. Observe leaves for signs of invertebrate feeding. Observe plant for signs on insect galls.

### **Invertebrate Chart**

<b>Location</b>	<b>Leaf Litter # of invertebrate species</b>	<b># of invertebrates species on Shrub (shake a shrub)</b>	<b>Feeding on leaves (present/absent)</b>	<b>Insect Galls (present/absent)</b>
Non-Native Plant				
Native Plant				



## **Take A Stand**

**Objective:** To understand how access for recreational activities impacts the environment and to appreciate the perspective of all the stakeholder groups.

**Activity Scenario:** Various recreational users wish to access a Natural Area which has previously had little human impact. A committee representing the different stakeholder groups has gathered to debate the issue of access into the Natural Area.

**Procedure:** Breakup into different stakeholder groups. Take 2-5 min to discuss your position from the perspective of that stakeholder group. Gather as a large group and debate the use of the Natural Area. Below are some sample ideas.

### **Stakeholder Roles:**

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#### **• Mountain Bikers**

- Desires trails for biking
- Wants an access road to the tops of the hills and shuttle service for transporting bikes

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#### **• OHV – Off Highway Vehicle users (ATV, motor bikes)**

- Wants wide enough trails for ATV use
- Needs to clear and maintain trails
- Wants to cross water-ways (Streams)

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#### **• Bird Watchers**

- Wants bird habitat protected
- Does not want fragmentation from trails and access roads as it will effect species diversity
- Is happy to hike into areas to view bird diversity

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#### **• Developers**

- Wants to build hotels, restaurant and shopping facilities to accommodate recreational users
- Wants to develop access roads that are safe for cars and tour buses to access the area.
- Requires parking lot space

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#### **• Nordic Ski Group (Cross Country Skiers)**

- Wants trails to be maintained and protected for their use
- Only need narrow trails and can use existing wildlife trails where appropriate.

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#### **• Campers**

- Requires space for camp sites and fire pits
- Wants garbage removal
- Bathroom facilities

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#### **• Hikers**

- Desires quiet spaces to explore
- Wants trails maintained

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#### **• Environmental Protection Group**

- Does not want the Natural Area disturbed
  - If recreation is approved for the area, there must be mitigation and activities to be modified for least disturbance
  - Soil, Water, Vegetation and Wildlife must be protected
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