Humans and Ecosystems

Key Question: How do human actions impact the ecosystems around them?

Learning Objectives:

SE5 Investigate human impact on ecosystems.

2. Compare a natural and a disturbed (altered) ecosystem and suggest ways of assuring their sustainability.

3. Explain why different ecosystems respond differently to short-term stresses and long-term changes.

4. Compare the risks and benefits to society and the environment of applying scientific knowledge or introducing a technology.

Learning Event:

Students will study the history of a specific region over time. Students will create a plan to return the area to it's natural state and evaluate the complications in this process.

Set: Show a historical map of an urban center from at least 50 years ago. (http://airphotos.rncan.gc.ca/photos101/regina_e.php?p=1). Next, compare that map with a current view of the same area from Google Earth. Have the students identify any significant changes or developments that they notice. Explain to the students that these changes are largely because of humans and the human population expanding.

Development: Discuss with the students the changes that we can see other than urban development. Explore how the prairie landscape is changed because of the human developments (agriculture, industry, etc.). If students are struggling thinking or imagining the differences, some photos that may help illustrate changes: http://www.superstock.com/stock-photos-images/1575-9138; http://agmachine.ning.com/photo/center-pivotirrigation-aerial)

Another good sources of examples is Google Earth. Highlight the shelter belts, the farm yards and how roads etc. influence how the land looks and is used.

Discuss with the students how these physical changes would have influenced the population changes in the ecosystems. For example, how would irrigation affect some plants? Ground dwelling animals? Etc.

Creating and displaying of before and after chart may help students who are visual learners to see the links between the changes.

It is important that students see that by changing one thing, you are influencing the entire ecosystem. Everything is connected to each other and by adding or removing elements, humans are changing how the ecosystem functions.

After several examples, give students information about the Prairie Grasslands. http://esask.uregina.ca/entry/grasses_and_grasslands_native.html

Compare the historical descriptions to the descriptions one would give of the pasture lands around similar areas. Assign each student a region to research . Students should learn what the ecosystem looks like now and what type of life it is sustaining. Have the students present a comparison chart to demonstrate:

1) What populations have left the area? What caused this?

2) How have the remaining populations changed and why?

3) Is there more or less diversity in these populations? How does this influence the sustainability of the ecosystem?

Extension: Explore photo images of Northern Saskatchewan as they have been influenced by mining. Show students images from Google Earth of these areas and point out the specific impacts that are visible to the ecosystems. Discuss what implications this is having on wildlife, pollution and sustainability.

Human Impact

	1	2	3	4
Historical	Student has inferred about the populations about the area but no research is apparent.	Student has done some research to find the historical populations but it is limited only to the most basic plants and animals. There are no details about the populations present.	Student has presented some research about many of the populations in the area. Specific details are given for a few animals.	Student has completed a thorough account of the historical populations in the area. A near complete list of plants and animals is present and the student has demonstrated an effort to gather information about the details of the population.
Population Changes	Does not give an indication of why or how the population changed beyond the inferred reasoning. Student has failed to back up any claims with research.	Identifies the populations that have changed and by how much but does not provide concrete details about the human causes behind those changes.	The changes in populations are researched and discussed well. There are clear links from human actions and populations changes.	The changes in populations are clearly researched and the causes are outlined succinctly. The human causes of the changes are clearly linked to each population and discussed thoroughly.
Sustainability	Student fails to identify how the population changes influence the sustainability of the ecosystem.	Student identifies a few factors that would effect the sustainability of the ecosystem but does not explore why or how to fix them.	Student identifies many factors that effect sustainability and demonstrates what could be done to benefit them	Student thoroughly discusses the factors that effect the sustainability of the ecosystem. The student also develops a detailed plan describing how to improve the sustainability of the ecosystem.