

## Grade 9 Science—Ecology Restoration Plan Assignment

It is important that as human beings we reduce our ecological footprint. Human beings have impacted local ecosystems through:

- urban sprawl and development which leads to habitat loss,
- overexploitation of various organisms which can lead to endangerment and extinction of one or many species;
- introduction of non-native species which destroys habitats for native organisms—this can possibly lead to endangerment or extinction of one or more species within the area
- pollution of atmospheric, terrestrial and aquatic ecosystems;



To do this, municipalities and other organizations, propose restoration plans. Restoration ecology studies strategies that can be used to restore an area to its former amount of biodiversity. In order to do this properly, researchers must know what the area supported before the impact and what caused the area to lose its biodiversity. Once this has been determined, action can be put in place to repair the area so that more organisms will be able to live in this region again. While a restoration plan may not completely restore an area to the way it used to be, it at least allows the area to have increasing number of organisms interacting in a sustainable ecosystem.

For this project, we are going to examine the grounds that surround a local park and then propose a restoration plan to increase biodiversity in this ecosystem.

### Preparation:

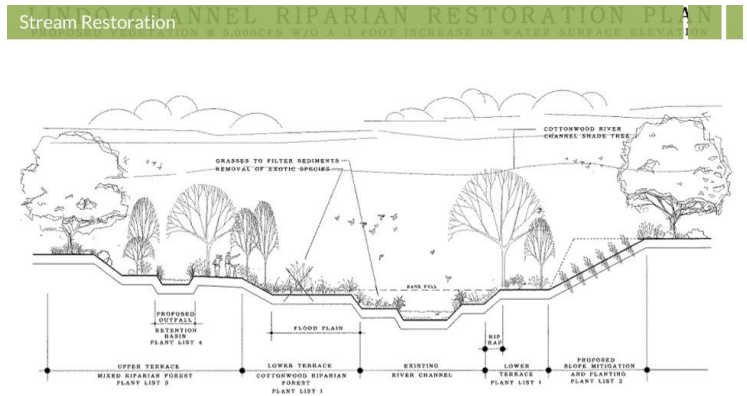
1. Read ecology restoration plans from Blake, L. et al (2009) “Restoration Proposal” p. 110-113 McGraw Hill Ryerson, ON Science 9 McGraw-Hill Ryerson; 1 edition (Aug. 4 2009)
2. Using Google Maps, determine how this land was originally used/or managed (i.e. was this a forest, a farmer’s field, etc.) before urbanization.
3. Consider what kinds of organisms (plants and animals), soil, light, water that is already present in and around the area that you intend to restore. (see inquiry activities for soil, water quality and invasive species to help inform your final plan)

When designing your restoration plan, consider the following (Taken directly from Evergreen.ca):

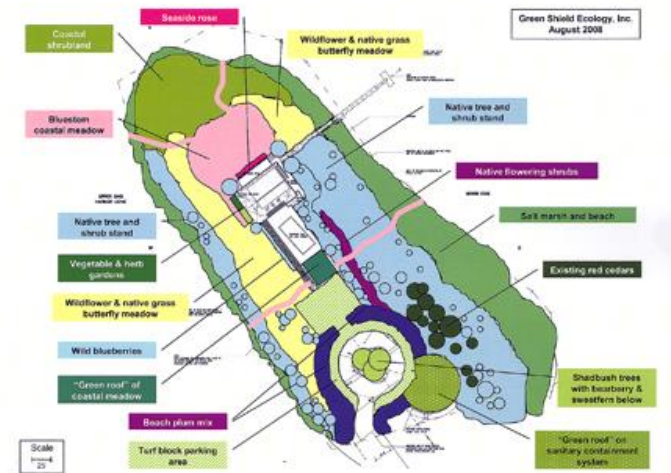
- (a) Water - are there any natural sources of water in the area? Are these sources healthy or unhealthy? Do you want to create a source of water such as a small pond?
- (b) Plants/Food - are there existing plants, shrubs or trees that provide food (e.g. blueberries, apples), shelter? What organisms would benefit from these plants? Are these plants native to this area and will they be sustainable once established?
- (c) Shelter - which areas in your landscape are shady? Sunny? Will your landscape, once it is established, provide sunny or shady areas? Are there areas where small animals may seek shelter during the summer months? For the winter?
- (d) Space - does your intended area provide spaces for students to sit and relax? How much space will you have to work with?

## Assignment

1. Write a 3-5 paragraph proposal that includes:
  - a) How you want to restore your area
  - b) The benefits to all the organisms that will use the area after it is restored (i.e. pollinators, birds, mammals, humans)
  - c) some of the cons/shortfalls of your proposal



**Figure 1: Stream restoration**



**Figure 2: Park restoration**

2. On blank paper, draw a map that shows how you hope to restore the area (see figure 1 and figure 2 as restoration map example).
3. Make a 3-5 minute sales pitch to your class city council (can be a video or done orally in front of the class) that outlines
  - a) the area before human impact,
  - b) your restoration plan for the area,
  - c) who or what benefits from your restoration of the area,
  - d) and why you feel that this is the best restoration plan.

Your presentation should include visuals to help the class understand your sales pitch.

## Evaluation: OF LEARNING

### Rubric

Criteria	Level 4	Level 3	Level 2	Level 1	Level R
<b>Knowledge /Understanding:</b>	In the proposal, student has demonstrated a thorough understanding of all the organisms that will benefit from restoring the area and how these organisms will be able to co-exist in a sustainable manner.	In the proposal, student has demonstrated a clear understanding of all the organisms that will benefit from restoring the area and how these organisms will be able to co-exist in a sustainable manner.	In the proposal, student has demonstrated a satisfactory understanding of all the organisms that will benefit from restoring the area and how these organisms will be able to co-exist in a sustainable manner.	In the proposal, student has demonstrated a limited understanding of all the organisms that will benefit from restoring the area and how these organisms will be able to co-exist in a sustainable manner.	In the proposal, student has not demonstrated an understanding of all the organisms that will benefit from restoring the area and how these organisms will be able to co-exist in a sustainable manner.
	Pros and cons of the restoration proposal are stated in tremendous detail.	Pros and cons of the restoration proposal are stated in detail.	Pros and cons of the restoration proposal are stated in limited detail.	Pros and cons of the restoration proposal are stated in little detail.	Pros and cons of the restoration proposal was not stated.
<b>Thinking and Inquiry</b>	Student has thoroughly researched the area that they are restoring, has considered the organisms that will be reintroduced.	Student has considerably researched the area that they are restoring, has considered the organisms that will be reintroduced.	Student has sufficiently researched the area that they are restoring, has considered the organisms that will be reintroduced.	Student has limitedly researched the area that they are restoring, has considered the organisms that will be reintroduced.	Student has not researched the area that they are restoring, has not considered the organisms that will be reintroduced.
	Student has come up with an insightful restoration plan.	Student has come up with a restoration plan.	Student has come up with an adequate restoration plan.	Student has up with a sufficient restoration plan.	Student has not come up with a sufficient restoration plan.
<b>Communication</b>	Sales pitch proposal is extremely detailed, clear and effective at communicating the restoration plan and why it should be implemented.	Sales pitch proposal is detailed, clear and effective at communicating the restoration plan and why it should be implemented.	Sales pitch proposal is somewhat detailed, clear and effective at communicating the restoration plan and why it should be implemented.	Sales pitch proposal has limited detail, clear and is not very effective at communicating the restoration plan and why it should be implemented.	Sales pitch proposal is missing and therefore does not communicate why the restoration plan should be implemented.

<b>Application</b>	Based on the research, student has come up with an extremely insightful restoration plan proposal that benefits all organisms in the area that would use it.	Based on the research, student has come up with an insightful restoration plan proposal that benefits all organisms in the area that would use it.	Based on the research, student has come up with a satisfactory restoration plan proposal that benefits all organisms in the area that would use it. Proposal and map of this restoration are satisfactorily detailed.	Based on the research, student has come up with a limited restoration plan proposal that benefits all organisms in the area that would use it. Proposal and map of this restoration have limited detailed.	Based on the research, student has not come up with a restoration plan proposal that benefits all organisms in the area that would use it.
	Student restoration plan map contains is thorough detailed.	Student restoration plan map contains considerable detail.	Student restoration plan map contains satisfactory detail.	Student restoration plan map contains limited detail.	Student restoration plan map is missing.