

Identifying Native and Invasive Species Activity

Curriculum Expectations

B3.5 identify various factors related to human activity that have an impact on ecosystems (e.g., the introduction of invasive species; shoreline development; industrial emissions that result in acid rain), and explain how these factors affect the equilibrium and survival of ecosystems (e.g., invasive species push out native species and upset the equilibrium in an ecosystem; shoreline development affects the types of terrestrial and aquatic life that can live near lake shores or river banks; acid rain changes the pH of water, which affects the type of aquatic life that can survive in a lake)

Learning goals: By the end of this lesson students show know and understand the following terms...

- **Biodiversity**--the variety of different organisms in the world or in a specific ecosystem.
- **What is considered biodiverse?** To be considered biodiverse, both the variety of different species (richness) and the abundance of each of species present (evenness) is considered. Areas that are biodiverse have high species richness and high species evenness. Areas that are considered less biodiverse may have high species richness and low species evenness, or low species richness and high species evenness. (<http://www.countrysideinfo.co.uk/simpsons.htm>)
- **Invasive Species**—is an organism that is non-native (from a different region of the world) to a specific ecosystem and whose presence can cause environmental, economic and/or hazard to human health (<https://www.invasivespeciesinfo.gov/whatis.shtml>)
- **Native Species**—is an organism that originally comes from a specific ecosystem. It can provide food, be used as a resource, be used as a habitat or to make habitats, or provides a specific function within the ecosystem.

Engagement Activity:

Lesson: Introduction Native, non-native and invasive species—video

https://www.youtube.com/watch?v=spTWwqVP_2s

While students are watching the video consider:

1. What is biodiversity?
2. What is an invasive species?
3. Why are invasive species so harmful?
4. How do invasive species get to their new habitats? Provide 1 specific example.

Take up video questions. Afterward go over terms and concepts such as, biodiversity, what is considered biodiverse, invasive species and native species.

In this lesson, students will examine the area they are proposing to restore based on how biodiverse it could become after implanting their restoration plan.

Some resources that will help students to identify native species in an area are:

<https://cvc.ca/your-land-water/countryside-stewardship/stewardship-resource-centre/home-and-garden/selecting-native-plants/>

On this page there are 5 different links that provide pictures of native species. In parkland, especially if it is mostly open field, this link would be the best

<https://cvc.ca/wp-content/uploads/2015/05/21310-prairie-and-meadowweb.pdf>

If the area to be restored is a wooded area, the following resource is useful

https://cvc.ca/wp-content/uploads/2015/11/Woodland-Plants_Landscaping-WEB.pdf

For identifying invasive species, the following resource is useful

<http://www.invadingspecies.com> – use the menu on the side to choose Invaders

In this activity, you will work in groups of 3 or 4. Students will mark off a 3-meter x 3-meter area. This can be done by having students walk in 9 pace side square. Once students have their areas marked off, they are to examine the species (plants and if possible animals) in the area. Students will take pictures and identify the different plant species in the area using the picture resource above.

Students will make a chart that shows species and the approximate number of individuals in this species. If they are too numerous to count, student can the number of individuals in a small section of their area and then extrapolate the number of individuals of that species in the entire area.

Numeracy Conversions

For example, if students count the number of individuals in 30 cm x 30 cm area (900 cm²), then they have to multiply the number of individuals by 100 to determine the approximate number of individuals in their 3 m x 3 m area (this is equivalent to 90, 000 cm²)

If students count the number of individuals in a 3 cm x 3 cm area (9 cm²), then they have to multiply the number of individuals by 10 000 to determine the approximate number of individuals in their 3 m x 3 m area (90, 000 cm²)

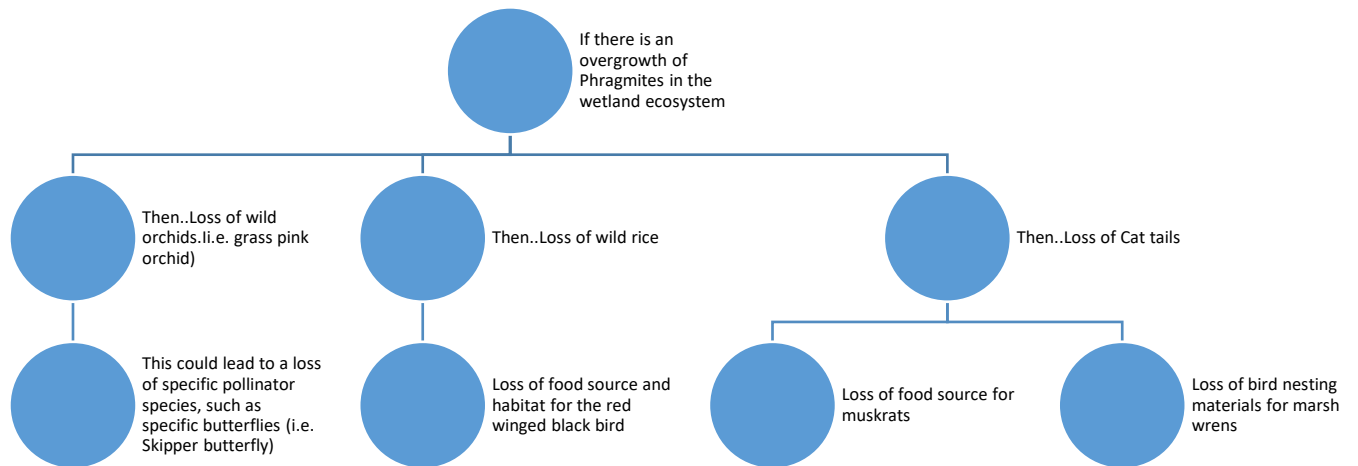
Observations:

Type of Species	Approximate Number of Individuals

Analysis

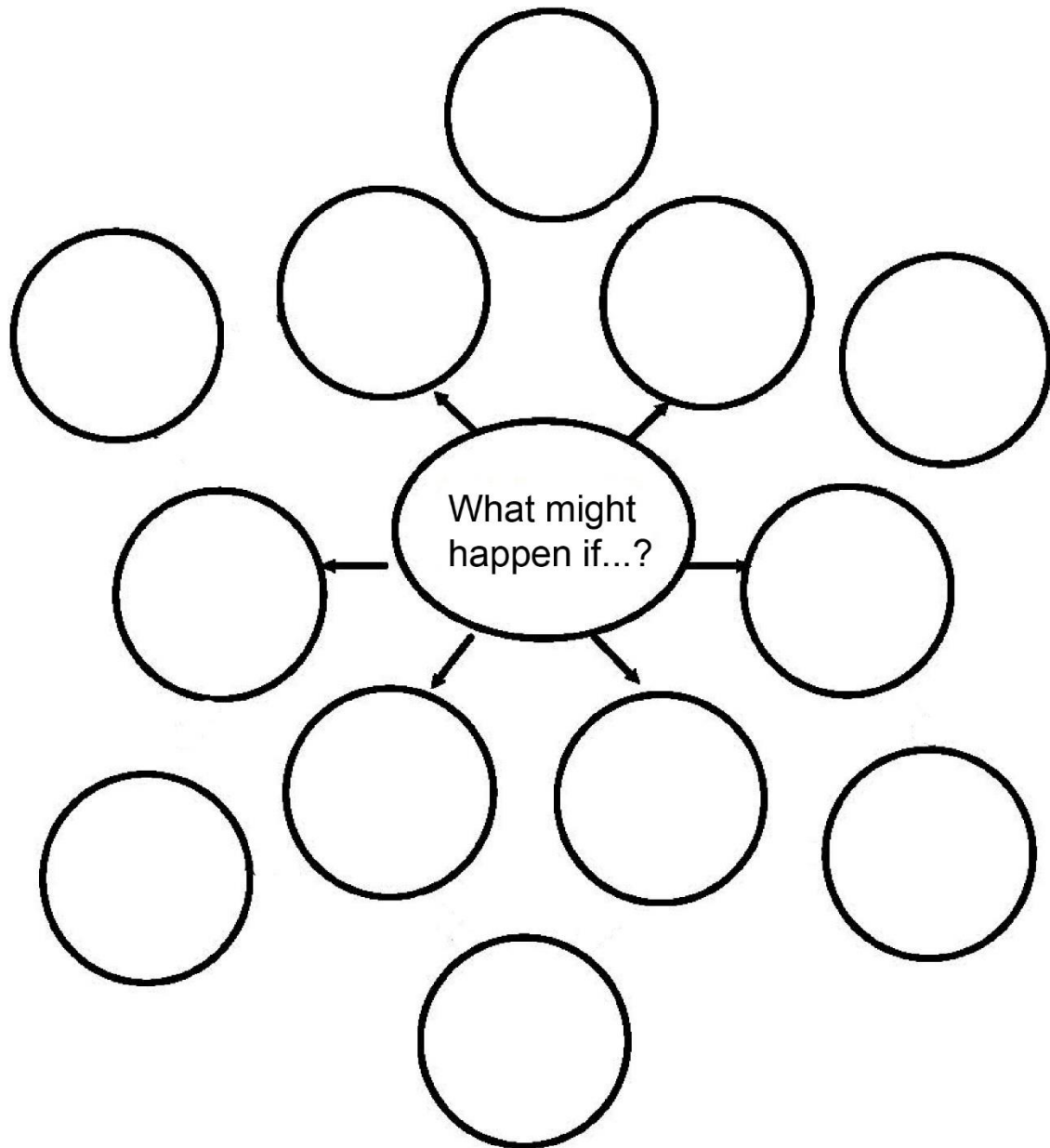
1. How many different species and what was the abundance of those individual species (ranked from greatest to least) that you observed in the area that you were examining? What does this mean for other organisms that could use this area?
2. How many invasive species occupied your area? Where is this organism originally from? How does or how might each invasive species impact the ecosystem that you have studied?
3. Using the Consequence Map below, determine 'What might happen if... to show why this particular invasive species is an issue.

For example: Phragmites is located in your wetland ecosystem



Here are some links to resources that might be helpful:

<http://ontariowildflowers.com/main/species.php?id=282>



4. Research: How would you modify your area to increase the native species in the area? What kinds of native species would you introduce? What types of native animal species would benefit from the reintroduction of these native species? What kinds of conditions do these species require and are these conditions present in this area?
5. See the links below. Not all non-native species are invasive? Are there any non-native species that would be beneficial to introduce in your area and why did you determine that it would be beneficial to do so?

<https://www.cbc.ca/news/technology/conservationists-debate-invasive-species-vs-non-native-labels-1.3474200>

<https://www.livescience.com/30119-invasive-species-plants-good.html>

Evaluation

Conversations—While students are conducting their field work and subsequent research, as a teacher you can go around and ask students the following questions.

1. Is there one species that is overrunning your area? Is it invasive or native? If it is an invasive species, where does it originate?
2. What is one native species that you were able to identify in your area? How does your native species help other organisms in this area?

Evaluation—This activity is FOR LEARNING.

Student Criteria	Exceeds expectations	Met expectations	Has not met expectations
I (student) am able to identify the different types of organisms that are in the area I am examining (Conversations, Analysis Questions, and/or Consequence Map)			
I (student) understand how invasive species impacts my local ecosystem. (Conversations, Analysis Questions, and/or Consequence Map)			
I (student) have come up with some solutions to restore native biodiversity to the area and demonstrated with the consequence map how all organisms are affected			

References

(n.d.) "Selecting Native Plants" Retrieved from <https://cvc.ca/your-land-water/countryside-stewardship/stewardship-resource-centre/home-and-garden/selecting-native-plants/>

Kachur, T. (2016) "Conservationists debate 'invasive species' vs. 'non-native' labels" CBC News One March 3, 2016