

RESEARCH ACTIVITY: THE IMPACTS OF ENVIRONMENTAL DISTURBANCES ON THE POPULATION DYNAMICS OF AN ECOSYSTEM

Biology, Grade 12 University Preparation, SB14U

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DESCRIPTION

In this research activity, students will apply what they learned from conducting population censuses. They will research a species at risk in Canada to develop both an understanding of the complexities associated with species and ecosystem management and an appreciation for the impacts of human activities on Canadian ecosystems.

CURRICULUM LINKS - BIOLOGY, GRADE 12, UNIVERSITY PREPARATION, SB14U

Overall Expectations: A1, F1, F2, F3

Specific Expectations: A1.1, A1.3, F2.1, F3.1-F3.3, F3.5

PLANNING NOTES

Background Information

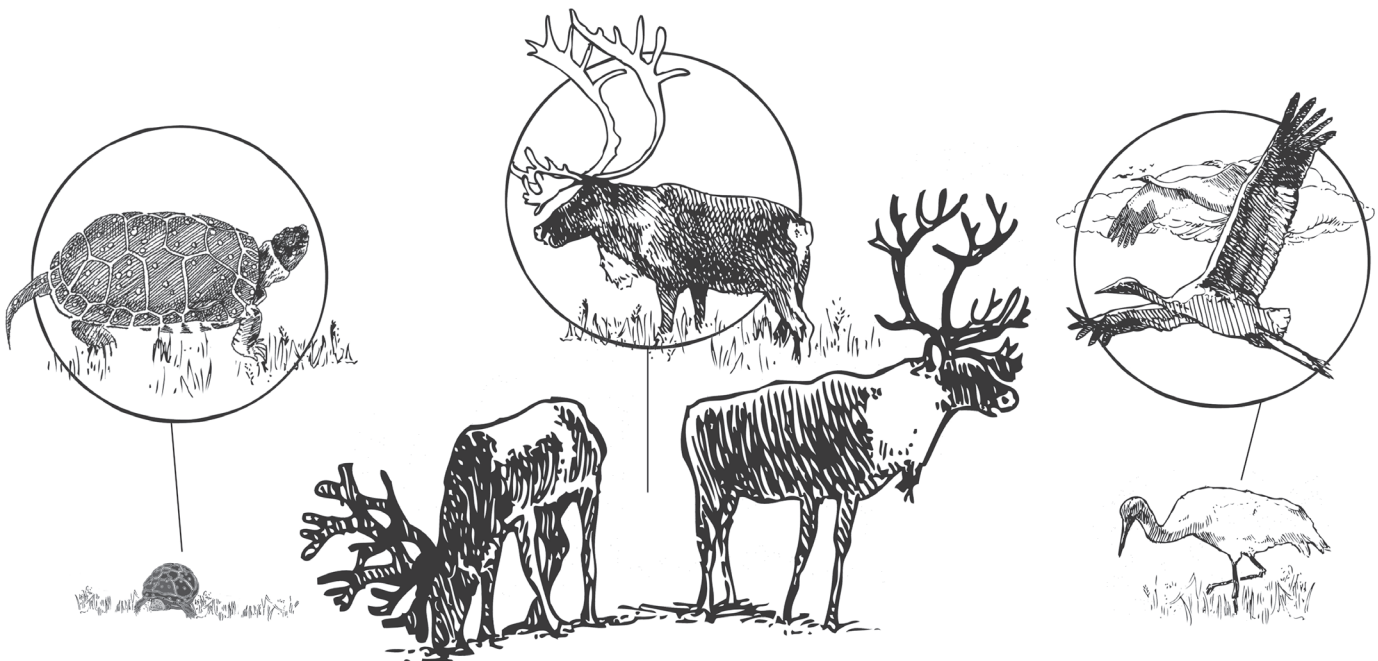
The population dynamics of an ecosystem and the determination of the current state of a species population dictate whether or not a species is “at risk”. Conducting a population census is one method ecologists use to evaluate the state of a species. Once a population is deemed at risk, recovery efforts can range from habitat restoration to relocation to the management of other species, such as predators. Each of these efforts can itself impact the population dynamics of species other than the one they are intended to benefit. The *Species at Risk Act (SARA)* was established in 2003 to protect, recover and manage indigenous wildlife species in Canada.

Resource

- Government of Canada, Species at Risk Public Registry
www.sararegistry.gc.ca

Recommended Class Time

2-3 periods



TEACHING/LEARNING STRATEGIES

Ignite

1. Display a list of Canadian species that includes both at risk and stable species. Examples of at risk species include the woodland caribou, blue whale, whooping crane and spotted turtle. Ask students to identify the species who are at risk and those who are stable
2. After identifying the at risk species, discuss potential reasons as to why these species are at risk, what factors contribute to an at risk status, and if some species are more at risk than others. Share ideas with the whole class or in a small group.

Explore

1. Explain that students will be conducting a research project on one of Canada's at risk species. Ask students to select a species using the Government of Canada's Species at Risk Public Registry.
2. After selecting a species, students can investigate the following guiding questions using the library or online resources:
 - What is the preferred habitat of the species? How does this species interact with other species in its habitat?
 - What are the challenges associated with getting an accurate count or estimate of the population size of the species?
 - What is the current state of the population of this species in Canada? Describe the characteristics of the population including, growth rates, density, distribution, and minimum viable size.
 - What are the two greatest threats to the species? Classify them as anthropogenic or natural. If the threats are natural, are human activities influencing the natural threat?
 - How is the disappearance of this species affecting the hierarchy of living things in its ecosystem? Are other species being affected by threats to this species?
 - Are recovery efforts in place to restore the population of the species, and if so, what do those efforts entail? What are the potential side-effects of this efforts?
 - How do the threats to these species connect to our everyday life? What can you do in your daily life to help mitigate the threats to these species?
3. Using their research, ask students to compile a report on their at risk species. Reports can vary in length, style, and medium.

Reflect

1. Display the selected species around the room and conduct a gallery walk for students to share their knowledge and learn more about other at risk species in Canada.
2. In small groups, work together to identify the species most at risk from the gallery walk and identify any common risk factors, including geography.
3. As a class, reflect on the research activity and ask students to share anything that surprised them about their species. Then discuss if there are more or less at risk species in Canada than they expected. What can they do with their information? How do at risk species impact our lives?

EXTENSIONS

Species Recovery: Using their research, ask students to develop three strategies to improve the quality of life of their species and promote recovery. Present these strategies to the whole class, compile the recommendations, and present them to your local conservation authority.

Ad Campaign: Create informational material (posters, brochures, PowerPoints, etc.) to educate others on Canadian at risk species. Display the finished materials in the library or conduct class to class presentations.