**Kirtland’s Warbler Classroom Activities - Grades 7 to 10**

**Ecological Decision Maker Game**

In this activity, students will be given a scenario and will take on the role of a scientist. They will have to choose how they would protect and conserve Kirtland’s Warbler if they were making the decisions in that situation.

**Instructions:**

1. Introduce the background information on the Kirtland’s Warbler.
2. Divide your class into groups of four.
3. Read the scenario to the class.
4. Give the groups 15 minutes to come up with a response. Have them discuss it between themselves and write down an answer.
5. Each group will present to the class.
6. After each group presents, give the class another 15 minutes to research online what people have done to help conserve the Kirtland’s Warbler in real life.
7. Ask students to share what they discovered.

**Background Information:**

The Kirtland’s Warbler is an endangered bird. Most of them nest in Michigan, but they breed in Wisconsin and Ontario as well. Animals like pigeons and raccoons that thrive in a lot of different environments are called habitat generalists. The Kirtland’s Warbler is a habitat specialist, it has very specific needs. They nest in two species of pine tree, the Jack pine and red pine. The pines need to be between 5 and 15 years of age. If the trees are too young or too old, the birds can’t live there. Jack Pines need fire for their cones to open and their seeds to spread. Before European colonizers arrived here, Indigenous people did controlled burns to help preserve these ecosystems, helping the animals that lived there. After the colonizers arrived, these practices were stopped. As a result, the habitat began to disappear. Kirtland’s Warbler populations declined. By the 1970s, there were only about 200 pairs left. By bringing back this habitat and doing controlled burns, scientists have helped this bird to recover. Right now, work is being done in Northumberland County to help restore habitat for these birds in Ontario.

**Scenario:**

You’re the head of a conservation authority. You’re hoping to attract the Kirtland’s Warbler to one of your conservation areas. This property used to be a grassland, before being cleared for agriculture. Since it’s stopped being farmed, it has filled in with invasive plants and shrubs. To restore the site for the warblers, you need to plant pines and other native plant species. The best way to clear the land and help the native species thrive is through a controlled burn. This will kill invasive species and help native species like the Jack pine to grow. Everyone at the conservation authority agrees that this is the best plan for restoring the site. You plan to have firefighters there and to use many different safety precautions. Despite this, many members of the community are worried about the plans for the controlled burn. They don’t want the fire to spread and cause damage. A lot of people have trouble understanding how a fire could actually help the environment. How would you help convince people that the controlled burn is both safe, and beneficial for the environment?

**Local Connections:**

If you’re based in the GTA, ask your students if any of them have ever heard of the prescribed burns that they have at High Park each year. If based in Northumberland/Peterborough/Prince Edward etc. ask students if they’ve ever heard of the Alderville Black Oak Savanna and the controlled burns that take place there. Connect the ongoing controlled burns at Alderville with traditional Indigenous land management practices.

**Inquiry-based Learning Questions**

* What are some habitats that are threatened by humans?
* What kinds of human activities threaten the environment?
* What’s an example of two living things that have a connection or relationship with one another?
* What are some native Ontario plant species?

**Learning Outcomes:**

The Kirtland’s Warbler is an endangered species. It has very specific habitat needs. One of the ways that scientists are helping to conserve it is through controlled burns. These burns are safe. They help native plants to grow and kill invasive species, helping to make a healthier habitat.

**Possible Student Questions:**

* Q: Why doesn’t the bird just live somewhere else?
* A: How would you like to live in the middle of Antarctica? Every animal has a habitat that it’s adapted to live in. They evolved to live there and have a relationship with all the other living things there. They can’t survive in another environment.
* Q: How are people helping this bird?
* A: People are planting forests with the Jack pine and red pine trees, and other native plants to help create the right habitat for them. The cones of the Jack pine tree only open up after a forest fire. Without fires, new Jack pines can’t grow. Scientists are helping the Kirtland’s Warbler by having safe, controlled fires in these forests to help make the habitat healthier. This allows the Jack pine and other native plants to grow and thrive.
* Q: Aren’t forest fires bad for the environment?
* A: A lot of the time, yes they are. The forest fires that we’ve had the past few summers in Canada have all caused a lot of problems. Those fires were caused by climate change, they’re not a natural part of the forest ecosystem. Some forest fires are natural and can are important in helping forests to regenerate and stay healthy. Jack pines need these fires to grow. It’s the only way that their cones will open, and their seeds will spread. Many native plant species benefit from these naturally occurring fires.
* Q: If the Jack pines need fire to open up their cones and grow, why don’t they just use the red pine?
* A: Up until very recently, scientists thought that Kirtland’s Warblers only nested in Jack pines. Recent research has revealed that they nest in red pines too, but a lot less frequently. Jack pines are still their favourites. Controlled burns are very safe, and they help a lot of other native plants to grow. They kill invasive species too.

**Curriculum Connections**

Grade 7:

Science:

• B. Life Systems - Interactions in the Environment

• B1. Relating Science and Technology to Our Changing World - assess the impact of human activities and technologies on the environment, and analyse ways to mitigate negative impacts and contribute to environmental sustainability

• B2. Exploring and Understanding Concepts - demonstrate an understanding of interactions between and among biotic and abiotic components in the environment

• E. Earth and Space Systems - Heat in the Environment

• E1. Relating Science and Technology to Our Changing World - assess the benefits of technologies that reduce heat loss, and analyse various social and environmental impacts of the use of energy from renewable and non-renewable sources

Geography:

• A1. Application: Interrelationships between People and the Physical Environment

• A1.1 describe various ways in which people have responded to challenges and opportunities presented by the physical environment (e.g., building dams, levees, or dikes to contain water and/or reclaim land; building terraces or irrigation systems to permit farming on inhospitable land; designing buildings suited to local climatic conditions or natural events such as earthquakes; specialized economic development such as resource towns in areas rich with ore, or tourism in areas of natural beauty or with a desirable climate), and analyse short- and long-term effects of some of these responses (e.g., water pollution from industry and agriculture; loss of animal habitat and wilderness areas as human settlement expands; deforestation and its consequences; the development of provincial or national parks to protect wilderness areas)

• A1.2 compare and contrast the perspectives of some different groups (e.g., Indigenous peoples living on the land, organic versus large-scale farmers, industrial and agrarian societies, owners of resource-extraction companies, environmental organizations, land developers) on the challenges and opportunities presented by the natural environment

• A1.4 assess ways in which different peoples living in similar physical environments have responded to challenges and opportunities presented by these environments, and assess the sustainability of these responses (e.g., land reclamation and flood control in low-lying areas such as the Netherlands, the Mississippi delta, the Mekong River; nomadic lifestyles of peoples in the Gobi or Sahara Desert versus extensive irrigation to create cities such as Las Vegas in the Mojave Desert; the development of ecotourism in the Costa Rican rainforest versus the clear-cutting of rainforests in the Amazon or Madagascar)

Grade 8:

 Science:

• D. Structures and Mechanisms - Systems in Action

• D1. Relating Science and Technology to Our Changing World - assess the social and environmental impacts of various systems, and evaluate improvements to the systems or alternative ways of meeting the same needs

• D2. Exploring and Understanding Concepts - demonstrate an understanding of different types of systems and the factors that contribute to their safe and efficient operation

• E. Earth and Space Systems - Water Systems

• E1. Relating Science and Technology to Our Changing World - assess the impact of human activities and technologies on the sustainability of water resources

• E2. Exploring and Understanding Concepts - demonstrate an understanding of the characteristics of Earth’s water systems and of factors that affect these systems

Geography:

• A. Global Settlement: Patterns and Sustainability

• A1. Application: Interrelationships between Settlement and the Environment - analyse some significant interrelationships between Earth’s physical features and processes and human settlement patterns, and some ways in which the physical environment and issues of sustainability may affect settlement in the future (FOCUS ON: Interrelationships)

• A2. Inquiry: Human Settlements and Sustainability - use the geographic inquiry process to investigate issues related to the interrelationship between human settlement and sustainability from a geographic perspective (FOCUS ON: Geographic Perspective; Interrelationships)

• A3. Understanding Geographic Context: Settlement Patterns and Trends - demonstrate an understanding of significant patterns and trends related to human settlement and of ways in which human settlement affects the environment (FOCUS ON: Patterns and Trends; Spatial Significance)

Grade 9:

 Science:

• B. Biology - Sustainable Ecosystems and Climate Change

• B1.1 assess impacts of climate change on the sustainability of local and global ecosystems, describe local or global initiatives for combatting climate change, and identify solutions to address some of the impacts

• B1.2 assess impacts of climate change on communities in Canada, including First Nations, Métis, and Inuit communities

• B1.3 investigate and explain how sustainable practices used by various communities, including First Nations, Métis, and Inuit communities, reflect an understanding of the importance of the dynamic equilibrium of ecosystems

Grade 10:

• Academic Science – B. Biology - tissues, organs, and systems of Living things

• Academic Science – D. Earth and Space Sciences – climate change

• Applied Science – D. Earth and Space Sciences - Earth’s Dynamic Climate