



## Using Technology to Curb the Spread of Invasives

### Organization:

**Title:** Using Technology to Curb the Spread of Invasives

**Summary:** Students learn about how modern forms of technology can be used to control invasive species impacting Indigenous land-based practices such as Dutch elm disease and phragmites.

**Inquiry Question:** Inquiry Question 4. What can be done to protect these plant species?

**Duration:** 1 class period (or 1-2 classes for extension)

**Learning Environment:** Classroom, outdoor

**Season:** Summer, Spring, Fall

### Materials:

- Heartbreaking But Good for Business.pdf
- Fighting Invasives with Eyes on the Ground.pdf
- First Nation Controlling Phragmites.pdf
- Video Titled "Students Kill Invasive 'Phrag' | National Geographic":  
<https://www.youtube.com/watch?v=N3P9wch5N3Y>

### Curriculum Links:

Grade 7 Science and Technology: A1.4, A3.2, A3.3, B1.1, B1.2, B1.3, B2.1, B2.8

Grade 9 Science: A1.5, A2.2, A2.4, B1.3, B2.4, B2.5

Grade 9 Academic Geography: B1.4

### Meta Data:

**Content Type:** Activity, community action project

**Bundle:** Tools

**Theme:** Invasive Species

**Subject Area:** Biology, Environmental Education, Geography, Health, Outdoor Education, Science, Social Studies

**Curriculum Focus:** 7, 9

- Teacher discusses with students how in response to Dutch Elm Disease many Indigenous community members are adapting new materials to build from.
- Teacher can segue this into a discussion related to how Indigenous communities are not static and a thing of the past but like all cultures are constantly adapting and evolving based on circumstances.
- Teachers introduce to students how scientists are attempting to manage Dutch Elm disease using a variety of methods. One of these methods uses a very similar approach to how disease is controlled in humans. For instance, it uses an inoculation of trees and hybrids



program approach. Students can review the information outlined in the article **Good for Business but Heartbreaking.pdf**.

- Teacher connects this discussion to human vaccines and the important role vaccines play in controlling the transmission of disease in human and non-humans in the natural world. It should be noted that trees are extremely expensive to inoculate. It costs approximately \$1000 per tree. For this reason, it is not feasible to vaccinate an entire forest, however, even inoculating a relatively small portion of a forest can help mitigate the spread of disease. How does this relate to the importance of humans getting inoculated? The more the better.
- Students review the impact of phragmites on local wetlands and associated Indigenous land-based cultural practices by reading the article **Fighting Invasives with Eyes on the Ground.pdf**.
- Students also read the following case-study **First Nation Controlling Phragmite.pdf** to identify ways Indigenous groups are combatting phragmites ie: community initiatives are attempting to eradicate phragmites by pulling it out as well as using drone technology to identify new growth.
- This can lead to a discussion focused on the important role of technology plays in ecological monitoring.
- To explore the role technology plays in ecological monitoring more deeply teacher can engage students in Learning Activity 13 from the Water Bundle: *Broken Promises and Access to Clean Drinking Water in Canada*.
- Students learn about initiative in US where high school students worked to eradicate phragmites in the following video titled “**Students Kill Invasive 'Phrag' | National Geographic**”: <https://www.youtube.com/watch?v=N3P9wch5N3Y>

Extension:

- Students identify areas in which phragmites is growing local to their school and make an action plan for its eradication. As part of this plan students must locate phragmites close to their school, be able to ID it (ie: tell it apart from native cattails) and come up with an eradication approach that will not further harm the wetland ie: pulling up vs. spraying harmful chemicals. Ideally, the students will be given the opportunity to carry out their plan. If this is not possible, students can prepare educational materials to educate another class in their school about the issue.

Please note that the learning represented in these activities reflects Big Idea B. in the Indigenous Knowledge Learning Bundle: “Indigenous Knowledge is Place-Based”. To help your students learn more about this Big Idea check out the Learning Activities titled: *Land-Based Meditation, Land Acknowledgement Workshop, Ceremony Ensures Right Relations with the Land, The Clan System, and The 13 Moons* found in the *Indigenous Ways of Knowing and Being*



# QUILLS

Queen's University Indigenous Land-Based Learning STEM  
Queen's University Biological Station

*with the Natural World Learning Bundle (Grades 7-10). The learning also reflects Big Idea C. in the Indigenous Knowledge Learning Bundle: “Reciprocity, Interdependence, and Holism are at the Heart of Indigenous Ways of Knowing and Being”. To help your students learn more about these concepts, foundational to Indigenous ways of knowing and being, check out the Learning Activities titled: *Holism*, *The Honorable Harvest*, and *Our Responsibilities* found in the *Indigenous Ways of Knowing and Being with the Natural World Learning Bundle (Grades 7-10)*.*