

A. Unit Overview

Essential Question: What invasive species are affecting our local watershed? ([Birds Eye View](#))

Enduring Understandings:

- Students will have a basic knowledge of Ecology entering this unit.
 - Producers, consumers (autotrophs, heterotrophs)
 - Food chains, Food webs, Flow of energy, 10% rule
 - Individuals, populations, communities, ecosystems, biomes, niche
 - Competition for resources, predation
 - Symbiotic relationships

Standards:

HS-LS2-1. Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.

HS-LS2-2. Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.

HS-LS2-6. Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.

HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.**

****Potentially**

HS-LS4-6. Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.**

Why am I teaching this unit?

I teach in an area of Vermont that is very rural, and many residents use the land as their means of survival, both financially and resourcefully. My hope is to inform the students of the plethora of factors that influence this area (specifically watershed) they call home. In addition, by **introducing invasive and non-native species** ([Sites of Engagement](#)), I hope to show students how fragile these ecosystems are, and how we need to protect/care for our lands, waters, and resources. I am not trying to turn anyone into a conservationist (although that would be fantastic!), merely show them how unique, important, and fragile their local watershed is.

What do I hope my students will accomplish and learn:

KNOW:

- Current and past water quality of Memphremagog watershed
- Biotic and abiotic factors that affect water quality
- Native vs. non-native vs. invasive species → similarities/differences
- How do invasives affect ecosystems
- What invasive species are potentially affecting our local watershed
- How to safely survey for invasive species
- How to collect, prepare, and analyze plant samples

DO:

- Analyze statistics of current/past water quality
- Identify local species
- Identify/study biotic/abiotic factors of watersheds
- Create a "watch list" of potential invasive species seen on site visit
- Build survey rakes for sampling
- Survey local water bodies for native/invasive species (mainly plants)
- Analyze and identify species in the field
- Write a report summarizing/analyzing the unit investigation

- How to safely survey for invasive species
- How to collect, prepare, and analyze plant samples
- The difference between native/non-native/invasive species
- Potential impacts of invasive species on ecosystems, critically analyzing case scenarios of invasive involvement and deciding potential impacts on native species/habitat

UNDERSTAND:

- All the living and non-living factors have influence on an ecosystem, and are connected to each other (interdependence)
- How invasive species can potentially harm/hinder an ecosystem (by analyzing specific examples)
- How human monitoring efforts can lead to information/knowledge → and potentially lead to action and change.
- Humans can be a negative AND positive influence on the spread of invasive species.