**Mapping the Spread Teacher Key: European Frog-bit**

Directions: Choose an invasive species in your region and research how and where it was introduced into North America and the Great Lakes basin. Use a map to follow the path of how it spread throughout the Great Lakes region.

1. What is the species? (Include both common name and *scientific name*.)

European Frog-bit (EFB); *Hydrocharis morsus-ranae*

1. Where is the species’ native range?

Found in Europe, Asia, and Africa

1. Why is the species a problem in the Great Lakes region?

EFB is able to spread and reproduce fast and in many different ways. It forms dense mats that can impair movement of boats and animals in the water and alter food and habitat for ducks and fish.

1. How does the species expand its range (move to new locations)?

EFB moves by wind and water currents and can stick to boats and boat trailers and other water equipment. When boats and other water equipment (water shoes, paddles, wetsuits, etc.) aren’t washed before being transported to another body of water, EFB travels with them and is deposited in a new location.

1. If not originally from North America, where was the species introduced into North America? **(Mark this location on the map)**

EFB was brought from Europe to the *Central Experimental Farm* in Ottawa, Canada in 1932. It was an ornamental plant in a water garden.

(<https://www.canr.msu.edu/news/european_frog_bit_be_on_the_lookout_for_this_aggressive_invasive_plant#:~:text=European%20frog%2Dbit%20was%20brought,Catling%20and%20Dore%2C%201982>).

1. How was the species first introduced in the Great Lakes region?

It escaped cultivation from the *Central Experimental Farm* water garden between 1932 and 1939.

1. Where was the species first documented in the Great Lakes Region? **(Mark this location on the map)**

EFB was first found in 1939 in the [Rideau Canal](https://www.rideau-info.com/canal/map-waterway.html) in Ottawa which connects the Ottawa River to Lake Ontario.

Partial timeline from [Sea Grant New York](https://www.seagrant.sunysb.edu/ais/pdfs/frog-bitfactsheet.pdf): 1952 EFB was collected at Montreal Island in the Ottawa River; 1976 found on the Canadian shore of Lake Erie; and by 1982 it was found along the Canadian shore of Lake Ontario. The first sighting in the United States was in 1974 in northern New York.

1. Where was the species first documented in Michigan? **(Mark this location on the map)**

Macomb County, 1996 (Note: Macomb County has shoreline along Lake St. Clair, between Lakes Huron and Erie along a major Great Lakes shipping channel.)

1. List all the other places in Michigan this invasive species has spread in-order of year it was found. **(Mark these locations on the map.)**

(Many resources including local media: <https://content.govdelivery.com/accounts/MIDNR/bulletins/29cc281>; <https://content.govdelivery.com/accounts/MIDNR/bulletins/29cd674>; <https://www.mlive.com/public-interest/2020/09/invasive-frogbit-continues-michigan-spread-with-new-infestations.html>)

Some answers are below:

* Wayne County, 2000
* Lake St. Clair, 2000
* Detroit River, 2000
* Monroe County, 2011
* St. Marys River in 2010/2012
* Saginaw Bay, 2014
* Arenac, 2016
* Alpena, 2018
* Grand River, 2019
* Pentwater Lake in 2019
* Still spreading… (that’s where you come in–keep your eyes open and teach others what to look for and prevent the spread)
1. What patterns did you notice in the spread of this invasive species?

EFB spread to the west from the east side of the Great Lakes then north into Lake Huron and the St. Marys River and west to Lake Michigan. It also started moving into inland lakes instead of just Great Lakes shorelines and tributaries.

1. What might be the cause of the patterns you noticed?

It’s possible that boaters transported EFB throughout the Great Lakes and inland water bodies when they moved their boat by trailer to other southern locations without cleaning them. (If people aren’t aware that it is something to watch out for, they may not notice it or know they’re spreading it.)

1. What could have stopped or slowed the spread of this invasive species?

Early detection and immediate eradication, not planting in water gardens, and cleaning boat trailers all would have been helpful. Increasing awareness of the issue would have supported these efforts.



