



Habitat Use and Movement Patterns across the Lake Whitefish Stock Complex in Lake Huron

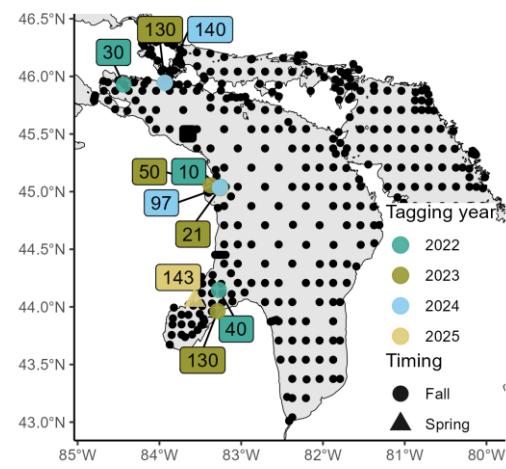
Project Lead: Tyler Funnell, PhD Student**Contact info:** tfunnell@usgs.gov**QFC Collaborators:** Travis Brenden**Other Collaborators:** C. Holbrook (GLFC), R. Claramunt (MDNR), D. Hondorp (USGS), T. O'Brien (USGS), Paul Ripple (BMIC), J. Tuomikoski (SSMTCI), Jason Smith (BMIC), A. Ackiss (USGS), J. Homola (MSU), J. Bonilla Gomez (USFWS), S. Koproski (USFWS), J. Jolley (MDNR), A. Honsey (USGS), J. He (MDNR)**Funding Agency:** Great Lakes Fishery Commission**Start Date/Status Date:** 2022/January 2026*Caption: Lake whitefish released following acoustic tagging.***Goal:** Describe space use and movement ecology of lake whitefish in Lake Huron to inform management actions.

- Objectives:**
1. Quantify management unit use of lake whitefish stocks across different seasons
 2. Assess seasonal depth and thermal habitat use in relation to lake whitefish body condition, age, sex, and stock
 3. Assess evidence of distinct, geographically or behaviorally coherent groups within and among lake whitefish stocks and determine relationships to genetics
 4. Compare current seasonal bathymetric and thermal habitat use with historic
 5. Quantify relationships between seasonal mortality and intrinsic characteristics of fish or environmental factors

Management Implications: The research will help managers determine whether current lake whitefish management units accurately reflect biological stocks or whether stock mixing and source-sink dynamics risk overharvest of less productive populations. By providing fishery-independent data on movement, habitat use, and spatial mortality, the study will provide critical information for more stock-aware, spatially explicit harvest regulations and improved stock assessment under changing ecosystem conditions in Lake Huron.

- Methods:**
- 791 lake whitefish from six locations have been tagged with acoustic telemetry and their movements in Lake Huron monitored through a grid of acoustic receivers distributed throughout the lake.
 - Lake whitefish genetic population structure is being evaluated using RAD-capture genotyping.

- Prelim. Findings/ Next Steps:**
- Preliminary findings suggest broad-scale spatial population structure – both genetic and behavioral
 - Preliminary findings suggest a high potential for mixing of stocks (genetic and spawning), particularly in southern Lake Huron.
 - Movements of lake whitefish will continue to be monitored through 2027 with initial analyses seeking to compare current and historic seasonal bathymetric and thermal habitat use.

*Caption: Map of acoustic receiver locations (black points) and lake whitefish tagging locations (colored points) labeled with number of fish tagged in Lake Huron.*

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