Connecting movement to management – insights from lake trout and lake whitefish near Good Harbor Bay

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Acknowledgements

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- Grand Traverse Band – Chris Hessell
- Little Traverse Bay Band – Jason Smith (now BMIC), Chad LaFaver(now Sault Tribe)

Background – Fisheries Management

Stocking



Harvest Regulation

Lake Superior

Lake Trout Management Unit, Major Ports/Areas	Possession Season	Size Restrictions (inches)	Lake Trout and Splake Combined Daily Possession Limit
MI 1-3: Windigo, Rock Harbor, Black River Harbor, Ontonagon, Upper Entry, Cooper Harbor	Open All Year	The minimum size limit for Lake Trout and Splake shall be 15"; the daily possession limit shall not include more than 1 Lake Trout 34" or greater.	3
MI 4-8: Big Bay, Marquette, Au Train, Munising, Grand Marais, Keweenaw Bay, Whitefish Bay NOTE: for Stannard Rock (MI-5) and Big Reef (MI-6) see below.	Open All Year	The minimum size limit for Lake Trout and Splake shall be 15"; the daily possession limit shall not include more than 1 Lake Trout 34" or greater.	5
Stannard Rock in MI-5 and Big Reef in MI-6, see pp. 9, 20	Open All Year	The minimum size limit for Lake Trout and Splake shall be 15"	1

Lake Huron

Lake Trout Management Unit, Major Ports/Areas	Possession Season	Size Restrictions (inches)	Lake Trout and Splake Combined Daily Possession Limit
MH 1: DeTour, Cedarville, St. Ignace, Mackinaw City, Cheboygan, Rogers City	Jan. 1 – Sep. 30 (Lake Trout and Splake)	The minimum size limit for Lake Trout and Splake shall be 15".	3
MH-2: Presque Isle, Rockport, Alpena, Black R.	Jan. 1 – Sep. 30 (Lake Trout and Splake)	The minimum size limit for Lake Trout and Splake shall be 15".	3
MH 3-6: Harrisville, Tawas, Grindstone, Harbor Beach, Lexington	Open All Year (Lake Trout and Splake)	The minimum size limit for Lake Trout and Splake shall be 15".	3

Lake Michigan

Lake Trout Management Unit, Major Ports/Areas	Possession Season	Size Restrictions (inches)	Lake Trout and Splake Combined Daily Possession Limit
MM 1-5: Menominee, Escanaba, Manistique, Harbor Springs, Charlevoix, Elk Rapids, Traverse City, Northport, Leland, Frankfort, Platte Bay	Jan. 1 – Sep. 30 (Lake Trout and Splake)	The minimum size limit for Lake Trout and Splake shall be 15".	2
MM 6-8: Arcadia, Manistee, Ludington, Grand Haven, Holland, New Buffalo	Open All Year (Lake Trout and Splake)	The minimum size limit for Lake Trout and Splake shall be 15".	3

Habitat Improvement



Nuisance Species Control



Fisheries Management – Harvest

- Lake Trout and Whitefish harvest are co-managed between Michigan and the Tribes.
- Harvest quotas are shared between recreational and commercial fisheries
- Harvest quotas determined with spatially explicit statistical catch at age models
  - Fishery Harvest/Effort
  - Biological Data – Age
  - Survey Data



Lake Superior

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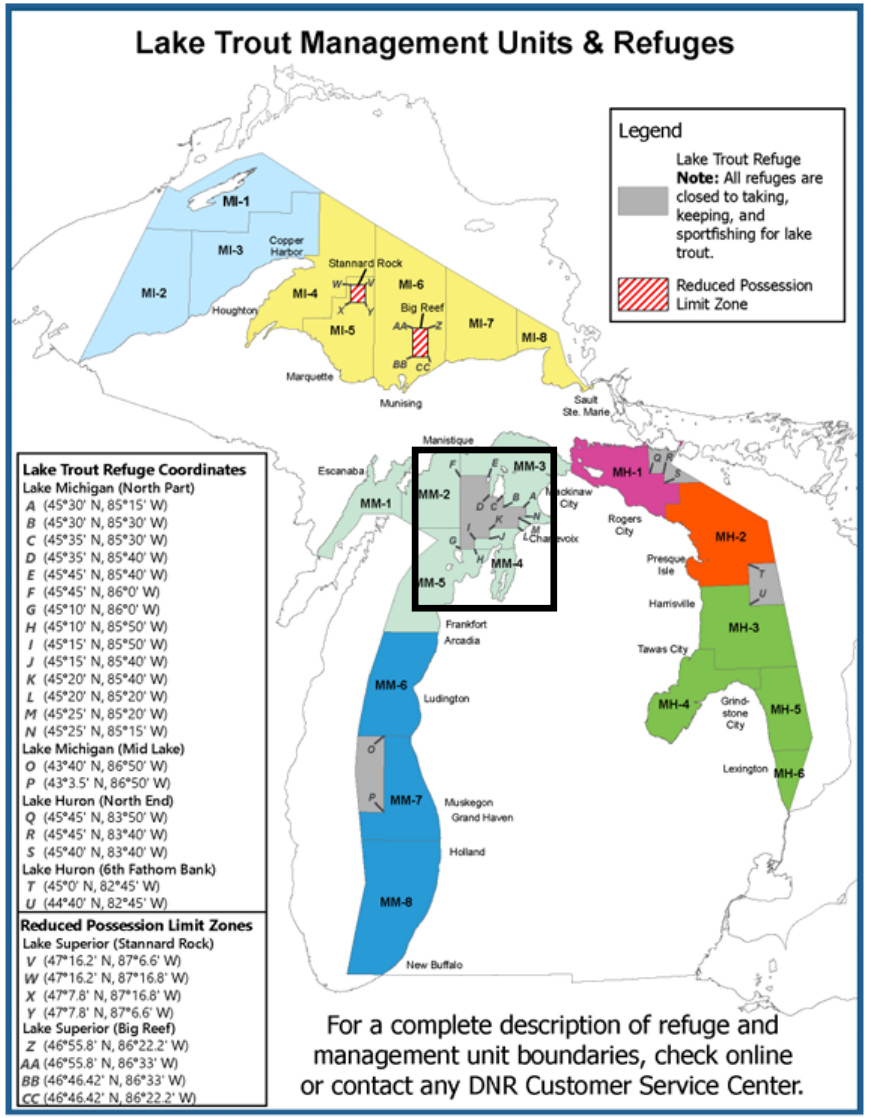
Lake Michigan

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Lake Trout & Splake Regulations

See below and p. 21 for Lake Trout and Splake size limit, possession season, and daily possession limit information.

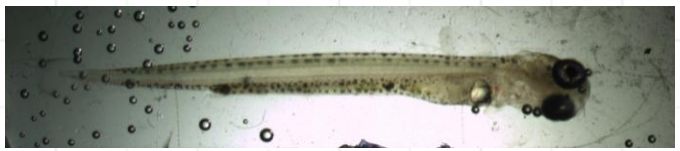
Map (below) and tables (p. 21) are color-coded by unit regulations. Any changes will be posted on the DNR website (Michigan.gov/Fishing) and in a pre-recorded message at 888-367-7060.

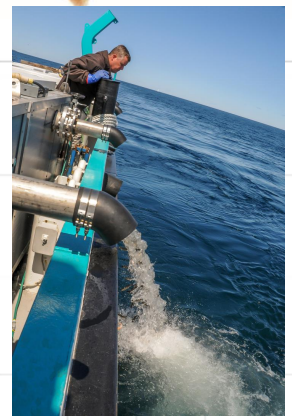


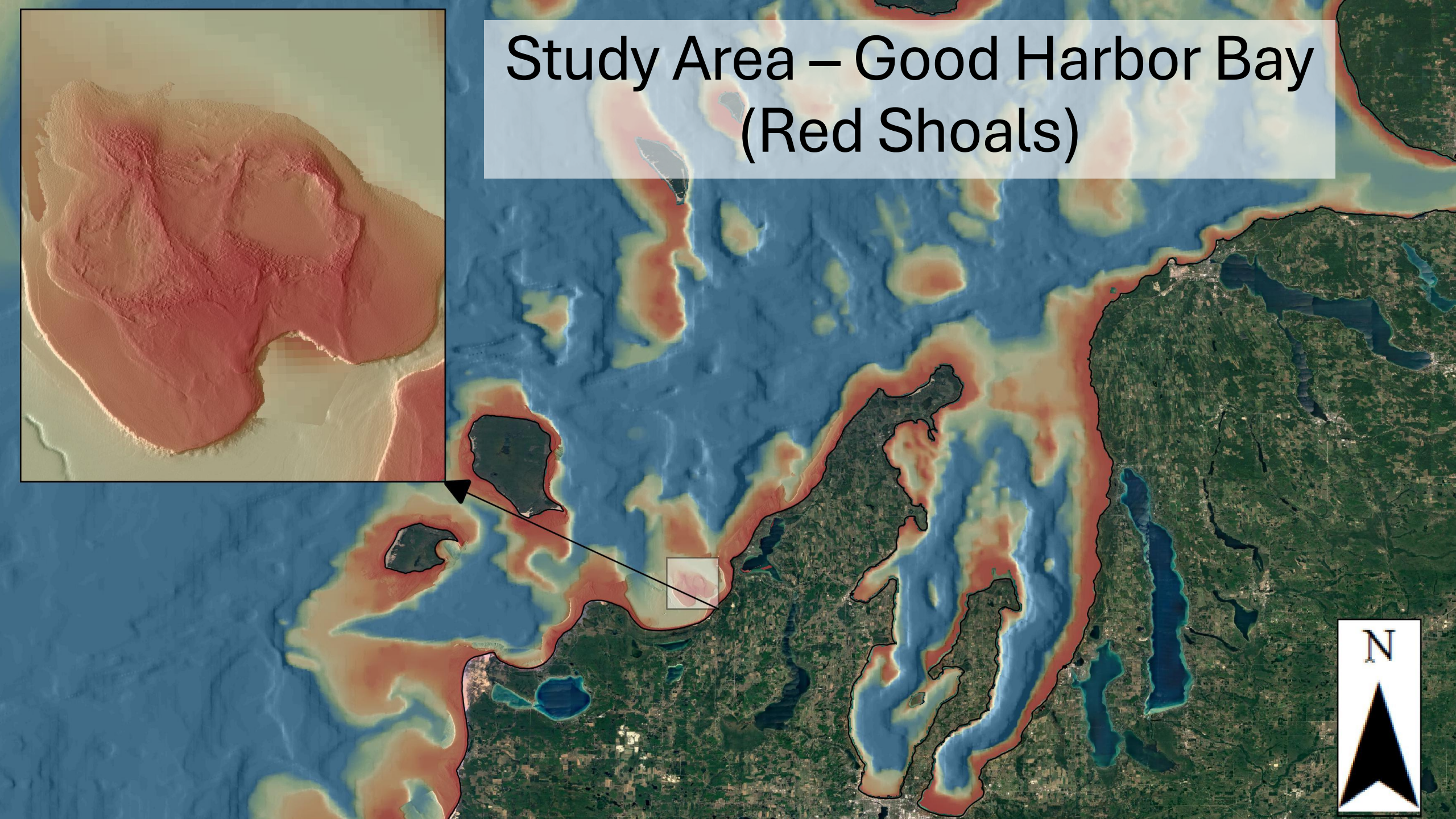
Local Lake Trout and Lake Whitefish Population Dynamics (Leland Area)



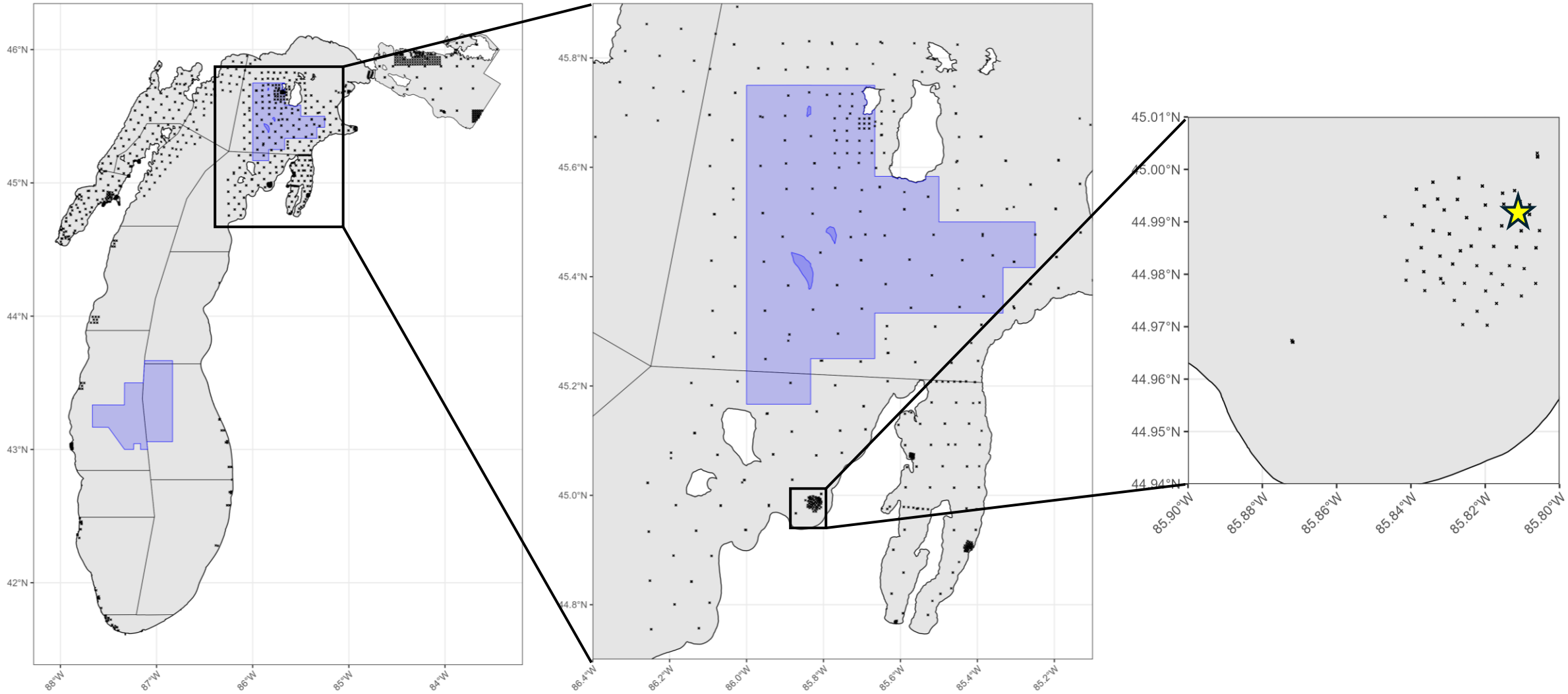







Study Area – Good Harbor Bay
(Red Shoals)
N

Acoustic Telemetry – Receivers

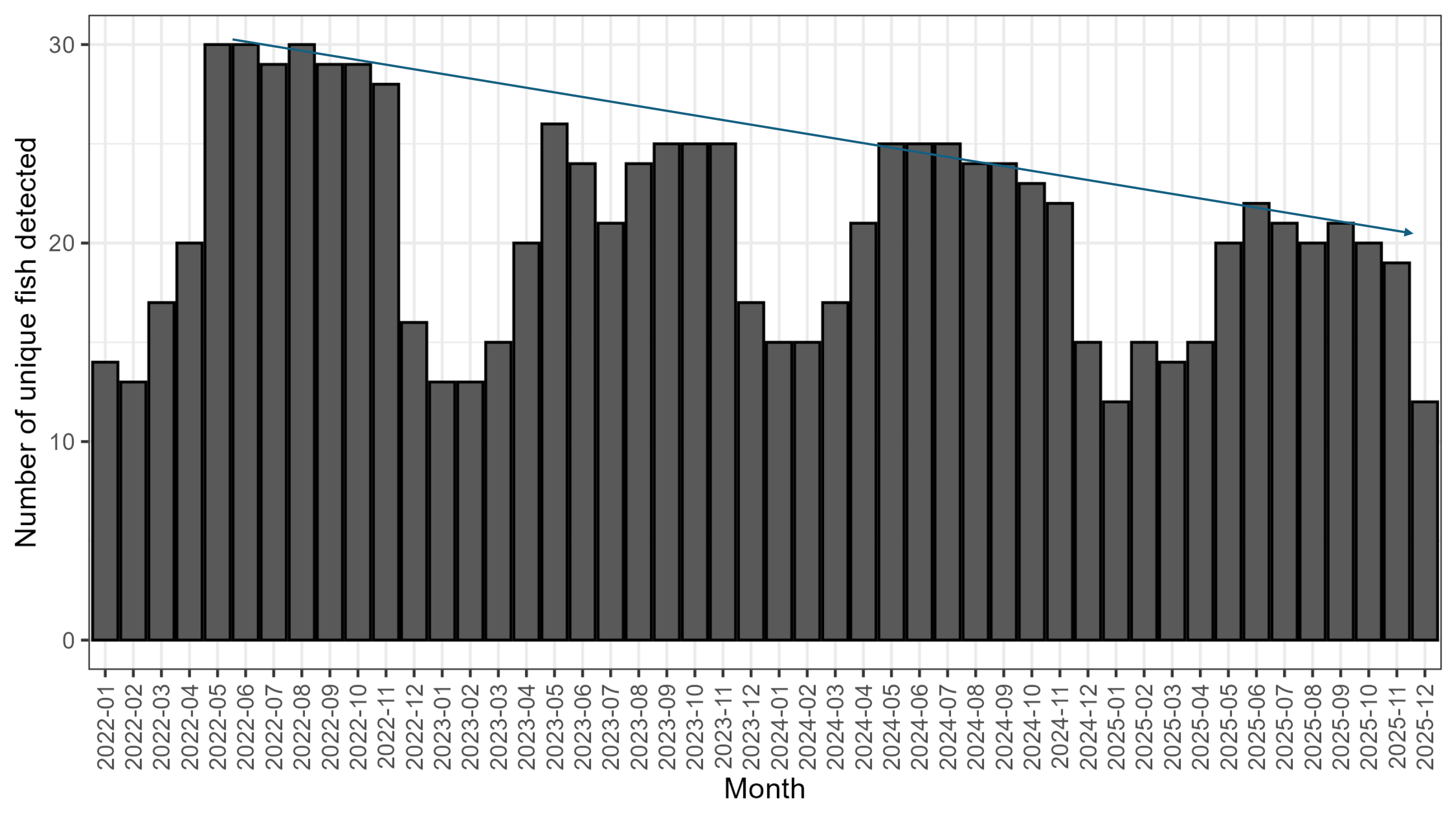


Acoustic Telemetry – Fish Tagging








Number of unique fish detected
30
20
10
0
2022-01
2022-02
2022-03
2022-04
2022-05
2022-06
2022-07
2022-08
2022-09
2022-10
2022-11
2022-12
2023-01
2023-02
2023-03
2023-04
2023-05
2023-06
2023-07
2023-08
2023-09
2023-10
2023-11
2023-12
2024-01
2024-02
2024-03
2024-04
2024-05
2024-06
2024-07
2024-08
2024-09
2024-10
2024-11
2024-12
2025-01
2025-02
2025-03
2025-04
2025-05
2025-06
2025-07
2025-08
2025-09
2025-10
2025-11
2025-12
Month



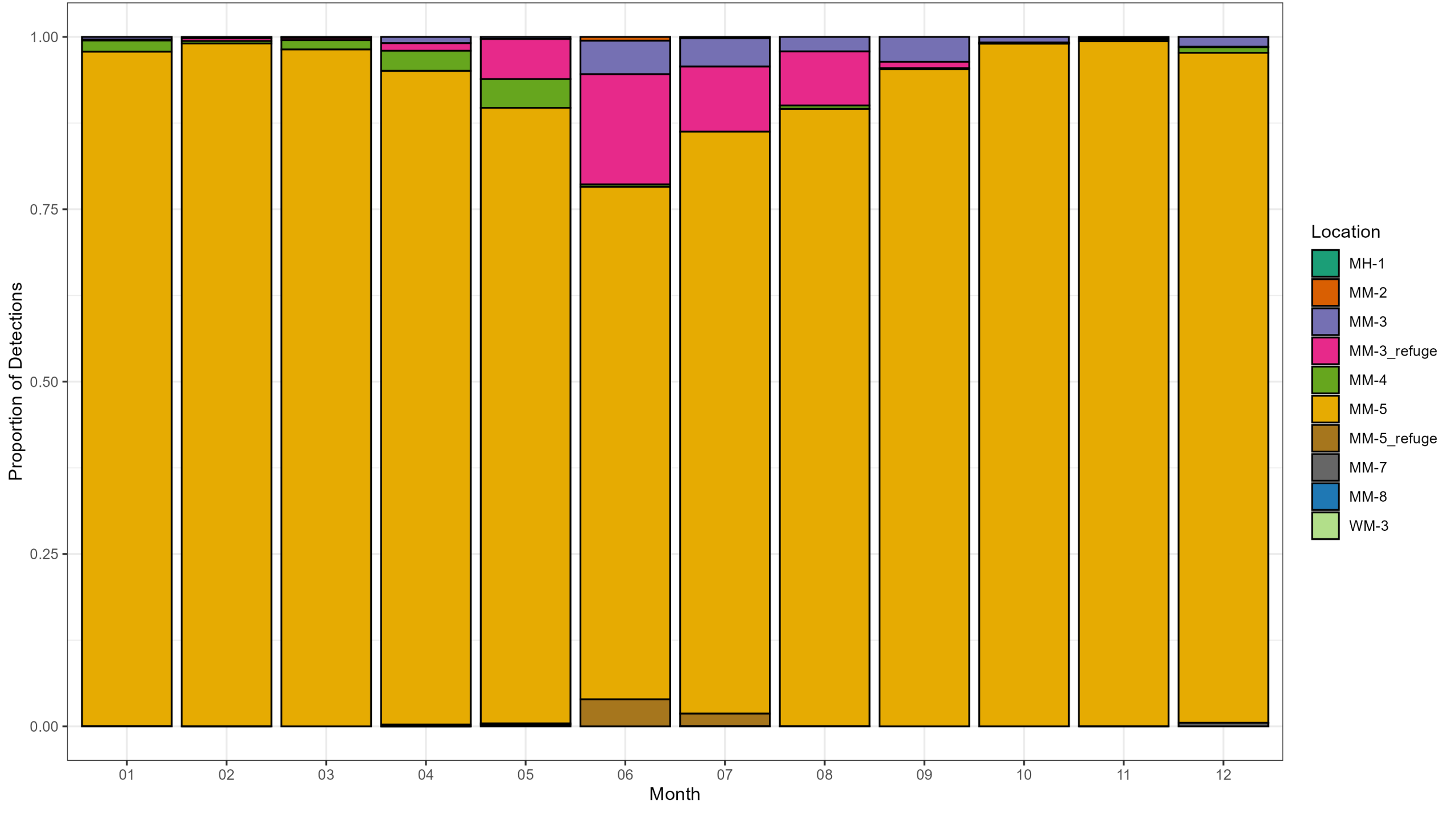
Detection Probability ● 0.2 ● 0.4 ● 0.6 ● 0.8

Detection Probability 0.2 0.4 0.6 0.8

01 n = 23
02 n = 22
03 n = 23
04 n = 30
05 n = 32
06 n = 33
07 n = 32
08 n = 32
09 n = 30
10 n = 30
11 n = 29
12 n = 24

Latitude: 45.8°N, 45.6°N, 45.4°N, 45.2°N, 45.0°N, 44.8°N

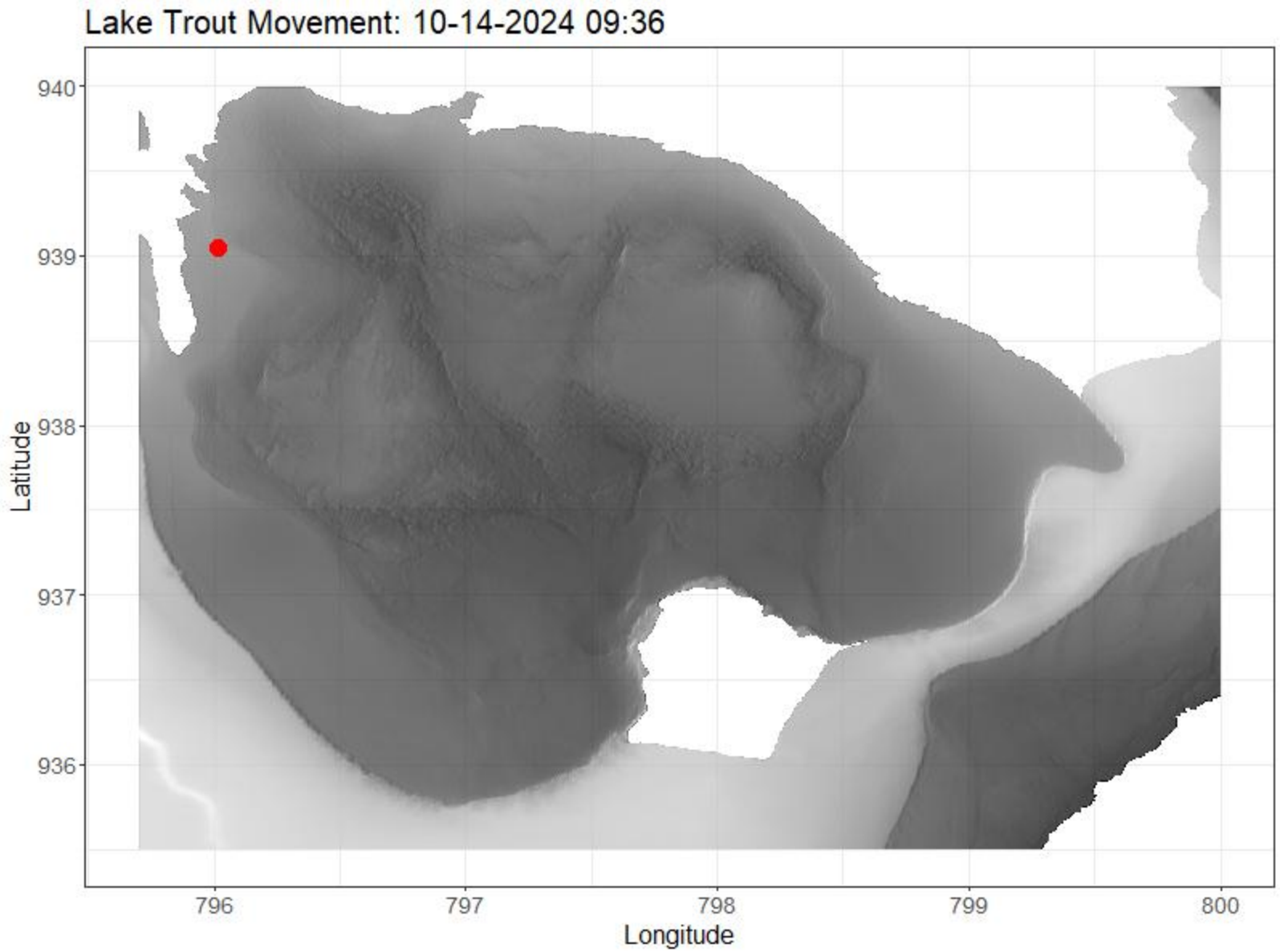
Longitude: 86.4°W, 86.2°W, 86.0°W, 85.8°W, 85.6°W, 85.4°W, 85.2°W


1.00
0.75
0.50
0.25
0.00
Proportion of Detections
01
02
03
04
05
06
07
08
09
10
11
12
Month
Location
MH-1
MM-2
MM-3
MM-3_refuge
MM-4
MM-5
MM-5_refuge
MM-7
MM-8
WM-3

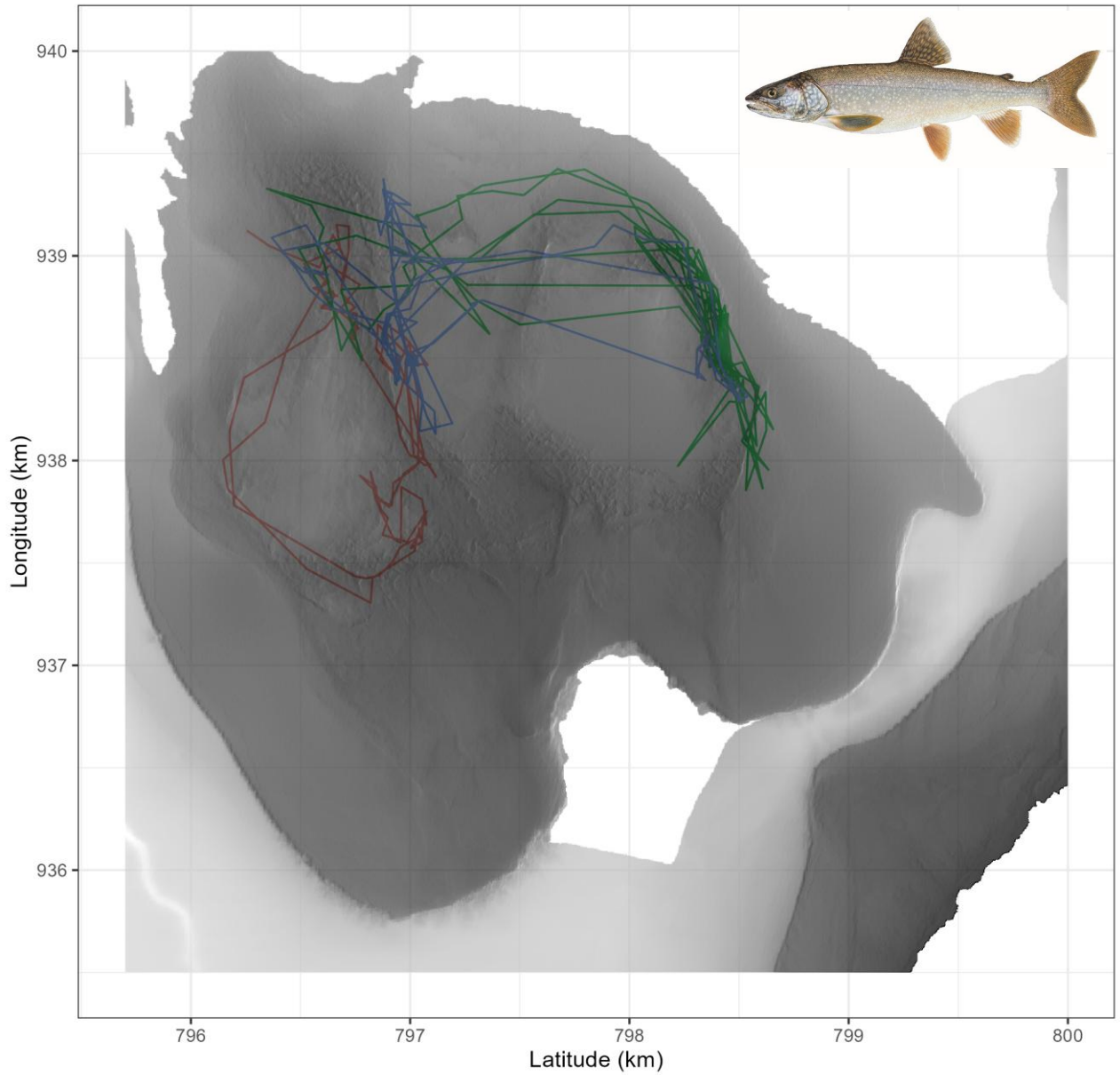
Fisheries Management – Habitat & Nuisance Species (Mussel Control)

Credit: Harvey Bootsma

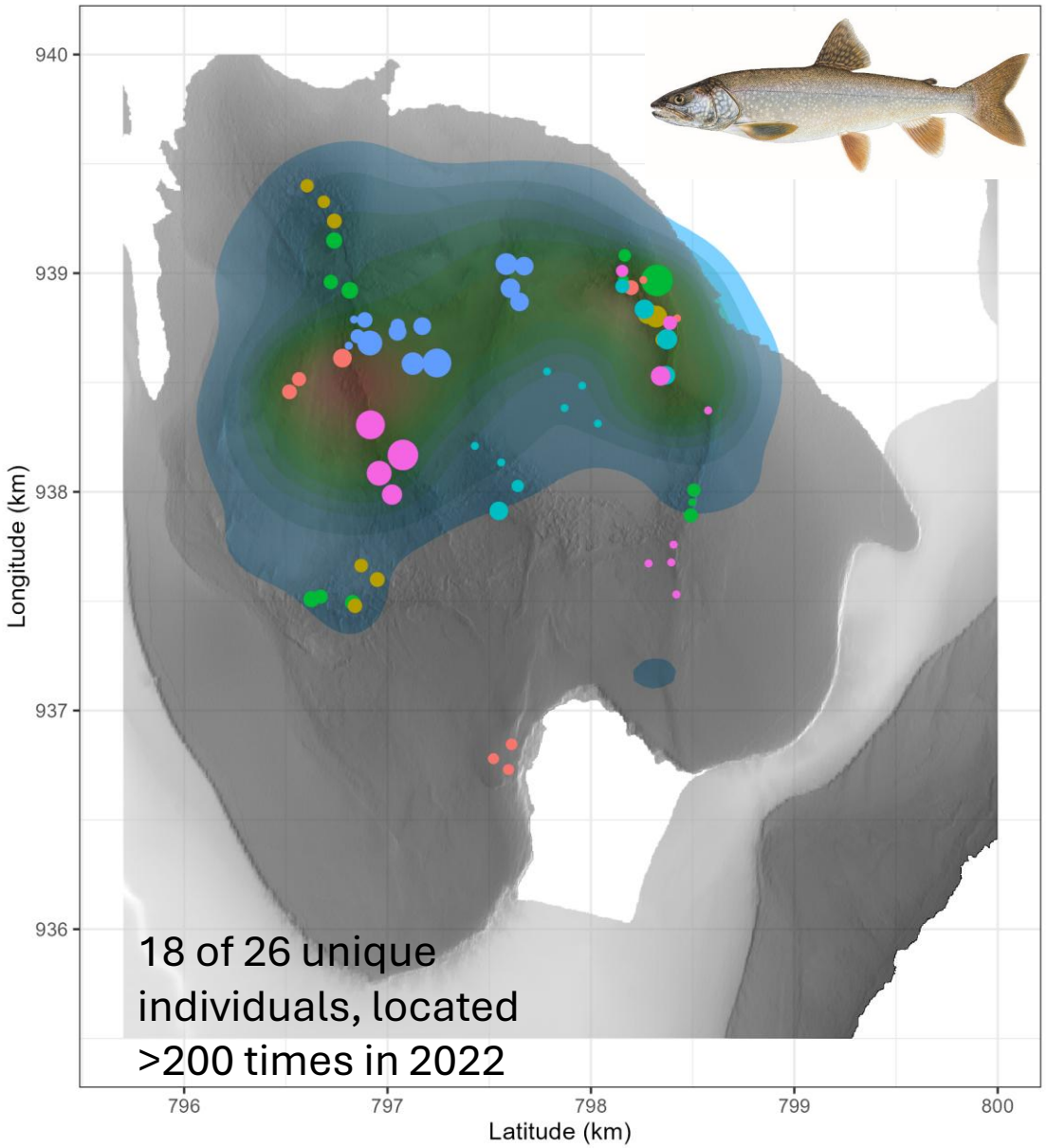



Lake Trout Movement: 10-14-2024 09:36
940
939
938
937
936
Latitude
796
797
798
799
800
Longitude

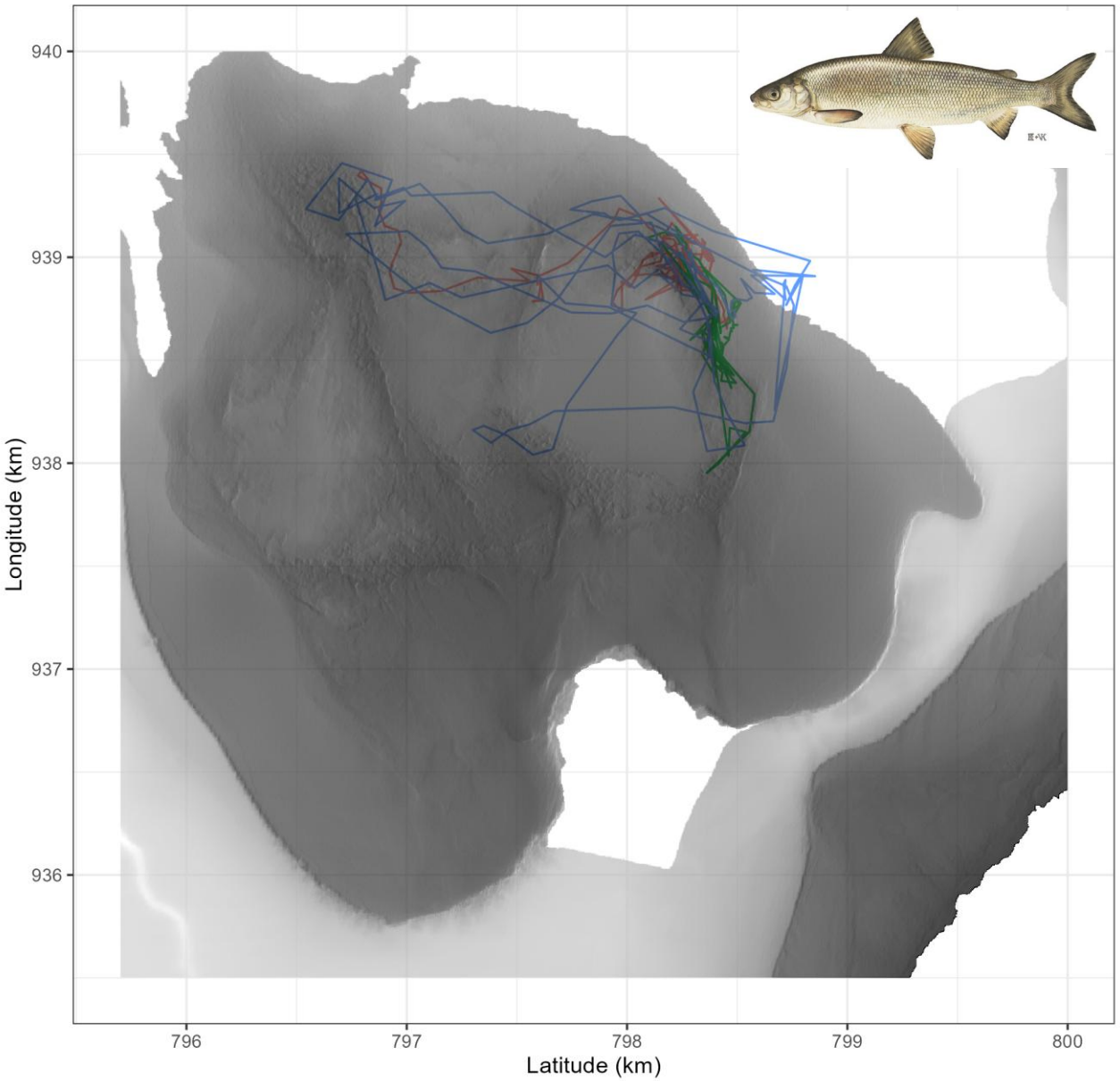
Lake Trout Movement Tracks (10/30 - 10/31)



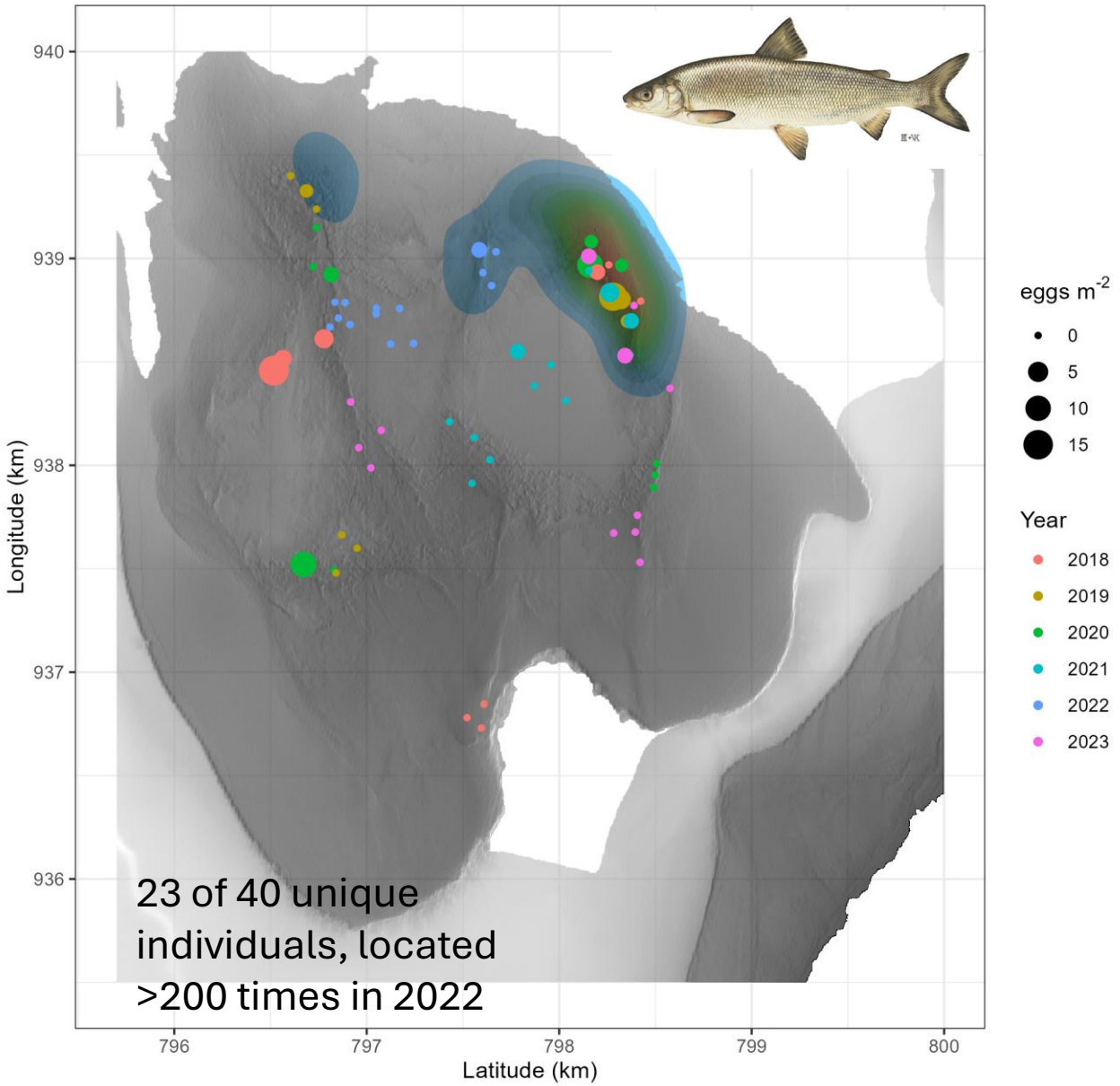
Spawning Lake Trout Positions and Egg Deposition



Lake Whitefish Movement Tracks (11/23 - 11/24)



Spawning Lake Whitefish Positions and Egg Deposition



LKT and LWF Presence Over Spawning Season

Credit: Taylor Skiles





Proportion of Unique Fish Positioned

1.00
0.75
0.50
0.25
0.00

Oct 2022 Nov 2022 Dec 2022 Jan 2023 Feb 2023

2022 Spawn Season

Oct 2023 Nov 2023 Dec 2023 Jan 2024 Feb 2024

2023 Spawn Season

Oct 2024 Nov 2024 Dec 2024 Jan 2025 Feb 2025

2024 Spawn Season

Date

Species
LKT
LWF

Conclusions

- Harvest
  - Verify/inform stock delineations
  - Verify/inform mortality rates

- Habitat Improvement and Nuisance Species Control
  - Identify high activity areas
  - Target restoration of nuisance species control





Questions

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