Fish and Aquatic
CONSERVATION

USFWS Fish Technology Centers

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National Fish Hatchery System and Applied Sciences Division

Fish and Aquatic Conservation, USFWS

(Jan 2025)

Fish and Aquatic Conservation Program

+ 1200
Employees

National Conservation Network

- **72 National Fish Hatcheries (1 Historic National Fish Hatchery)**
- **7** Fish Technology Centers
- **6** Fish Health Centers
- 1 Aquatic Animal Drug Approval Partnership
- **51** Fish and Wildlife Conservation Offices

5 Core Programs

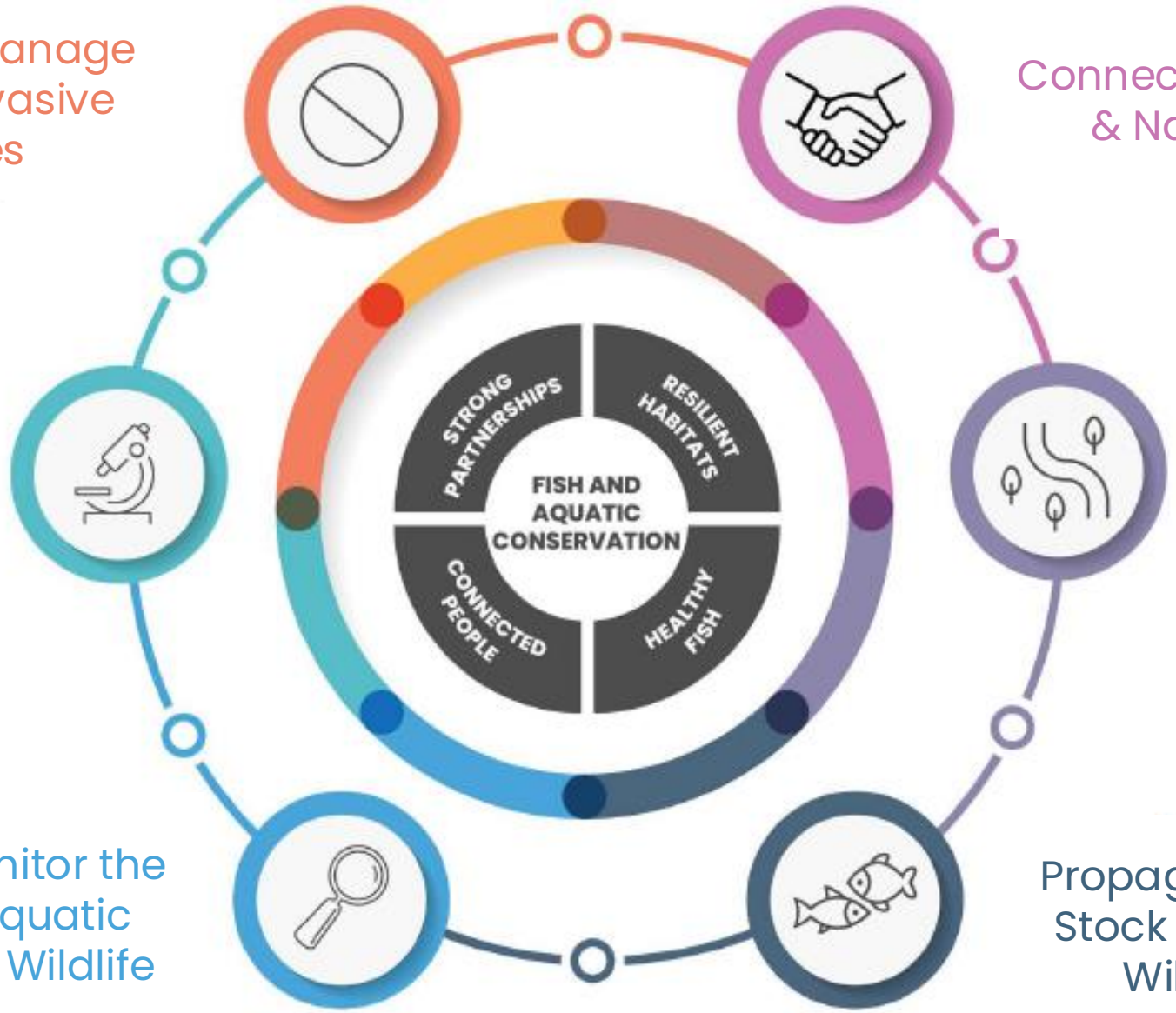
- **National Fish Hatchery System**
- Maintenance & Equipment
- Habitat Assessment & Restoration
- Population Assessment & Cooperative Management
- Aquatic Invasive Species

How We Work: Conservation Toolbox

Prevent & Manage Aquatic Invasive Species

Connect People & Nature

Use & Applied Science and Cutting-Edge Technology



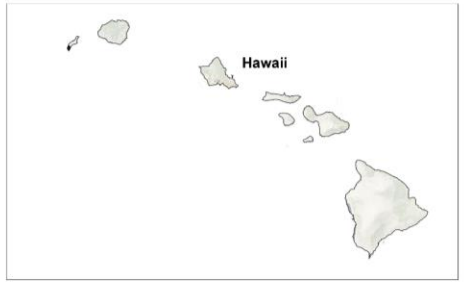
Restore Habitat

Assess & Monitor the Health of Aquatic Habitat and Wildlife

Propagate and Stock Aquatic Wildlife

U.S. Fish & Wildlife Service

Fish and Aquatic Conservation Facilities



Facilities

- Fish and Wildlife Conservation Office
- National Fish Hatchery
- Fish Health Center
- Fish Technonolgy Center
- Fish and Aquatic Conservation Headquarters & Aquatic Animal Drug Approval Partnership

Research & Applied Science

Mission- Provide leadership in the scientifically based management of national fishery resources through development of new concepts and techniques to solve specific problems in aquatic restoration and recovery activities

Fish Health Centers

Fish Tech Centers

Fish and Wildlife Conservation Offices

Aquatic Animal Drug Approval Partnership

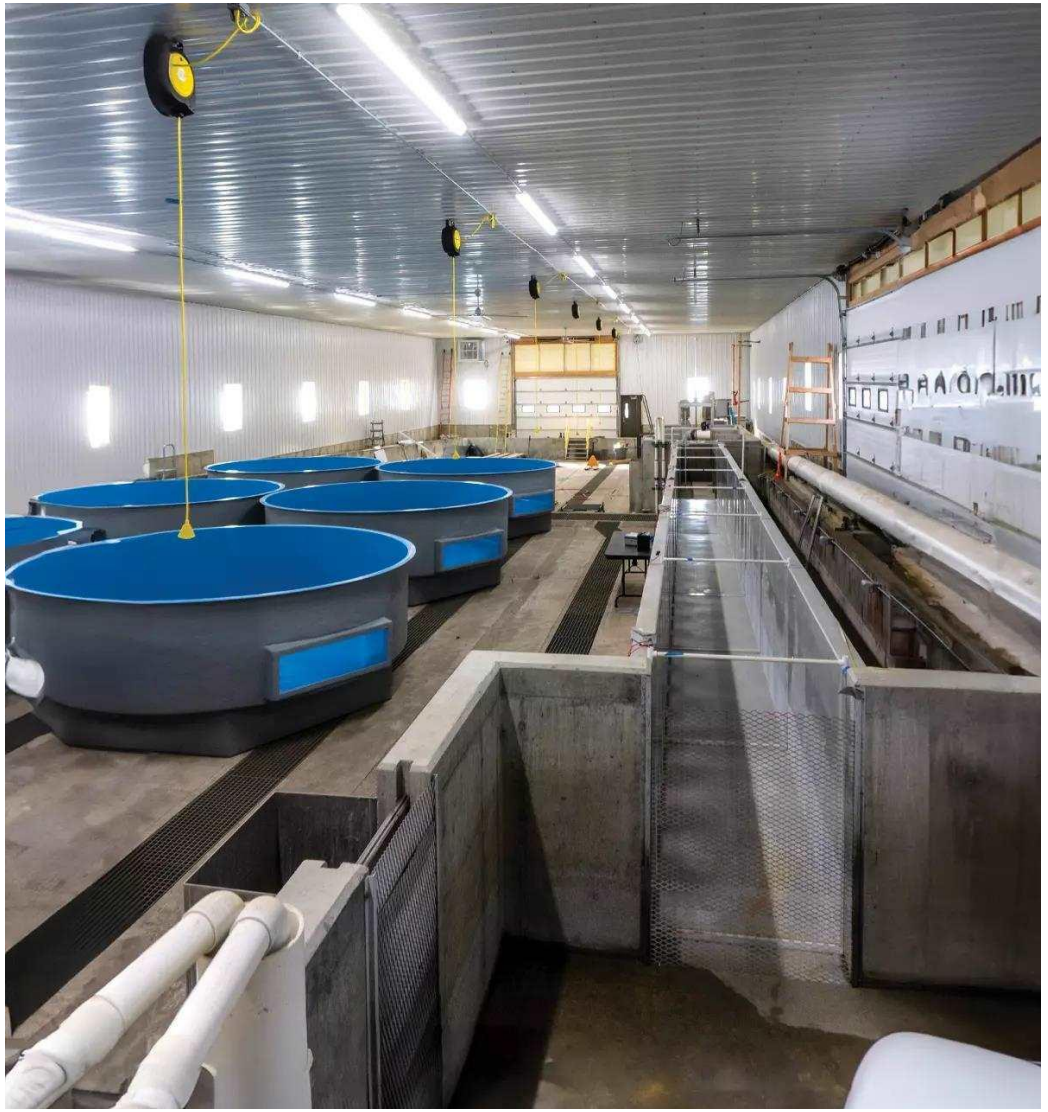
Fish Technology Center Research Programs

- Genetics
- Physiology & Nutrition
- Biobanking & Cyro
- Aquaculture research
- Fish Passage
- Quantitative Ecology
- Data Management
- Population Dynamics

Bozeman FTC

Fish Passage Research Program

- Barrier height
- Flow rate
- Water temp



Abernathy FTC

Quantitative Ecology Research Program

- PIT tag retention in YY male brook trout
- Condition assessments
- New tech development

Assessing superimposition of listed tule fall Chinook salmon redds using aerial and ground surveys on the White Salmon River, Washington

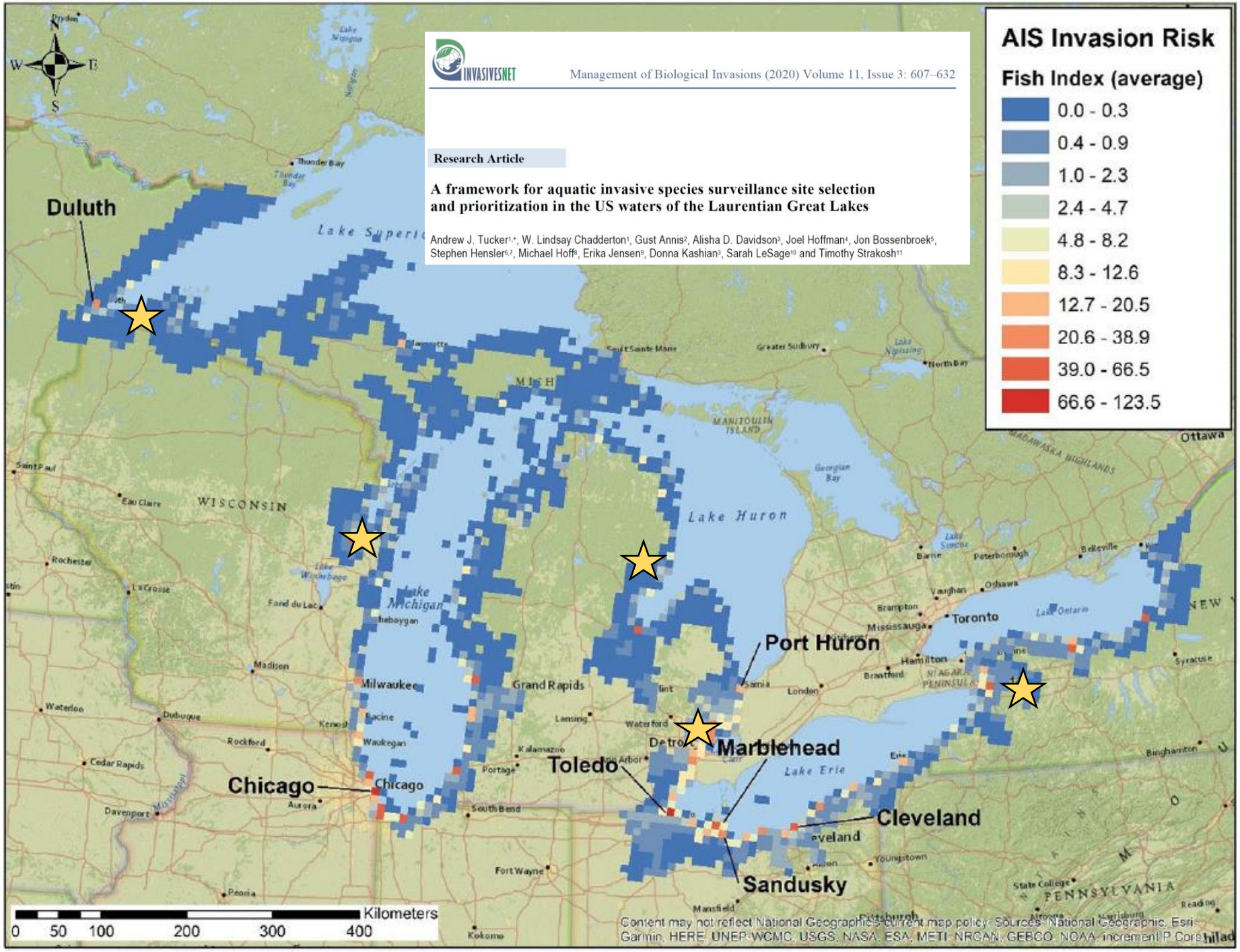
Monitoring & Assessment Work Group

In the Early stages!

- Representatives from all Regions
- Integrates staff across stations

- Opportunity to ID shared needs & priorities
  - Project A & M
  - Biological A & M

AIS monitoring in the Great Lakes Basin



INVASIVESNET Management of Biological Invasions (2020) Volume 11, Issue 3: 607–632

Research Article

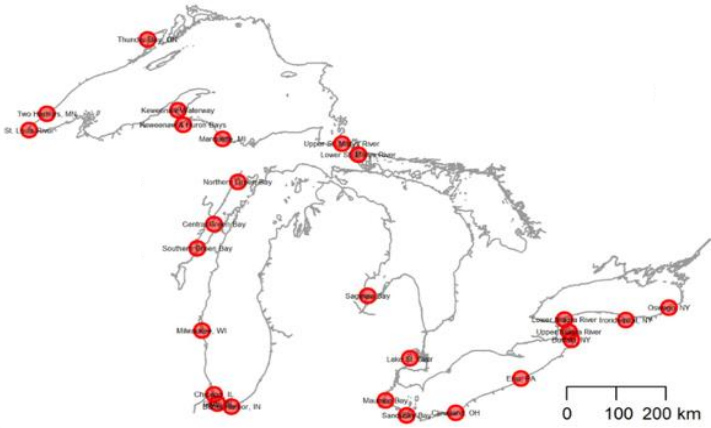
A framework for aquatic invasive species surveillance site selection and prioritization in the US waters of the Laurentian Great Lakes

Andrew J. Tucker[1,*], W. Lindsay Chadderton[1], Gust Annis[2], Alisha D. Davidson[3], Joel Hoffman[4], Jon Bossenbroek[5], Stephen Hensler[6,7], Michael Hoff[8], Erika Jensen[9], Donna Kashian[3], Sarah LeSage[10] and Timothy Strakosh[11]

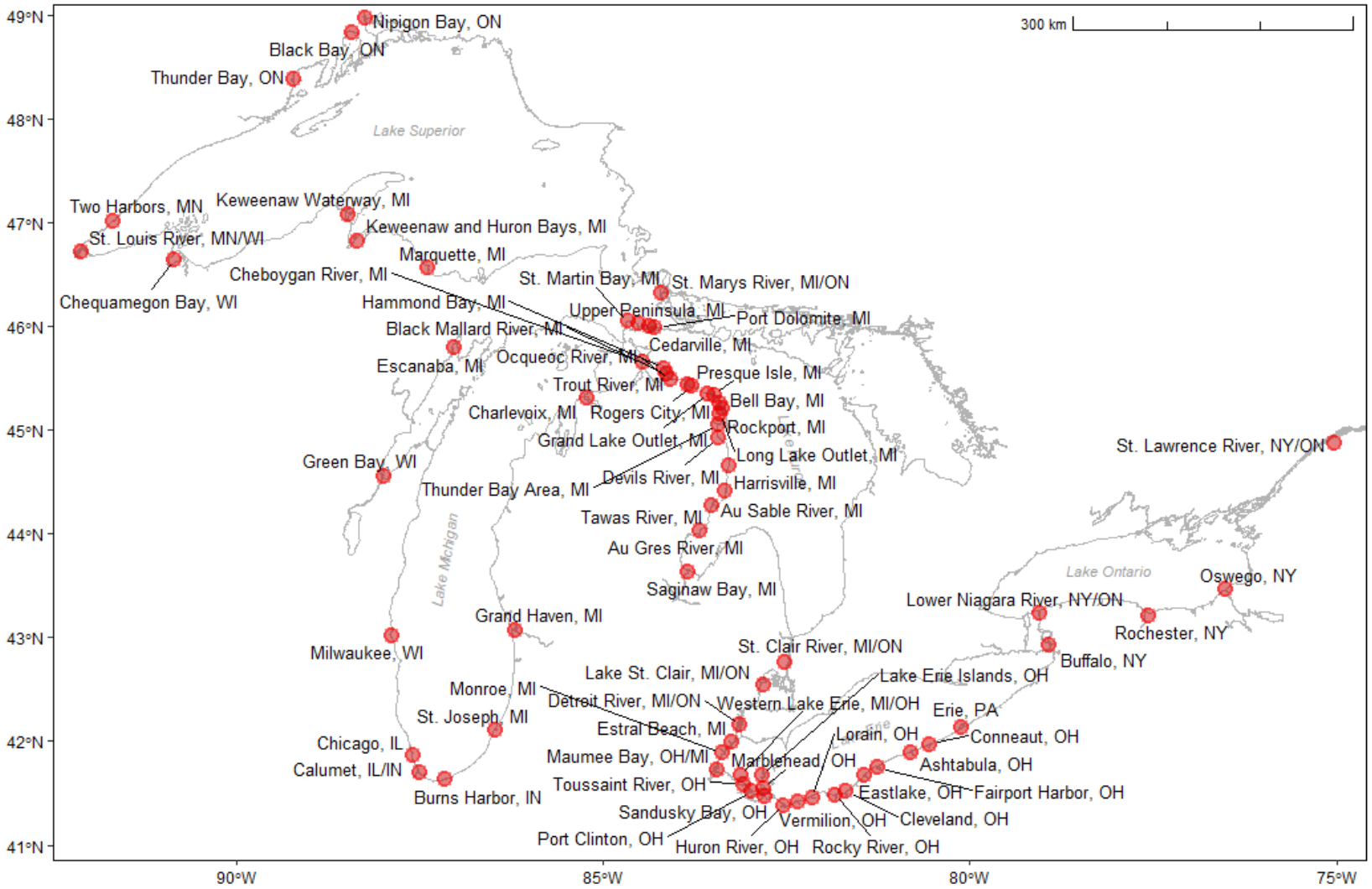
★ **USFWS Fish and Wildlife Conservation Offices**

- Ashland, WI
- Green Bay, WI
- Alpena, MI
- Detroit Substation, MI
- Lower Great Lakes, NY

26 hotspots sampled each year for AIS (fish and invertebrates):



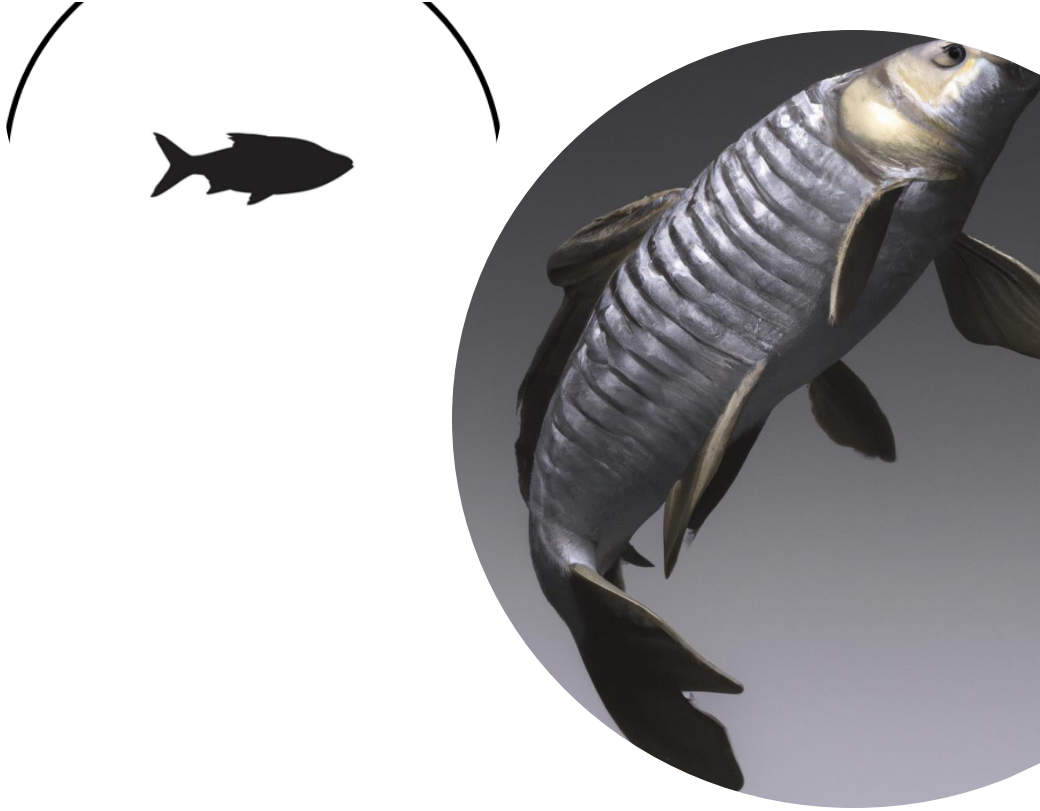
2010–2023 AIS Efforts Monitoring for AIS (fish)

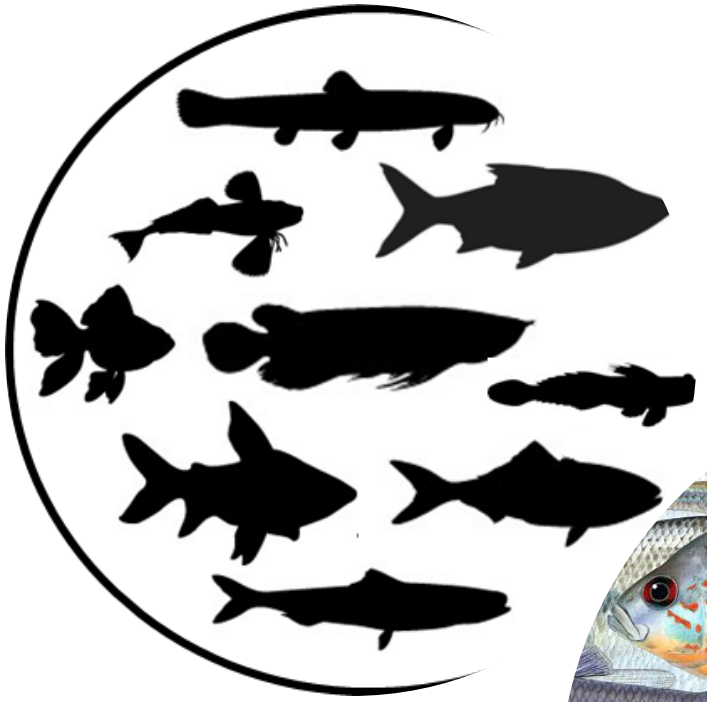


Future AIS Directions

Species of interest is predetermined –

"Targeted Surveillance”

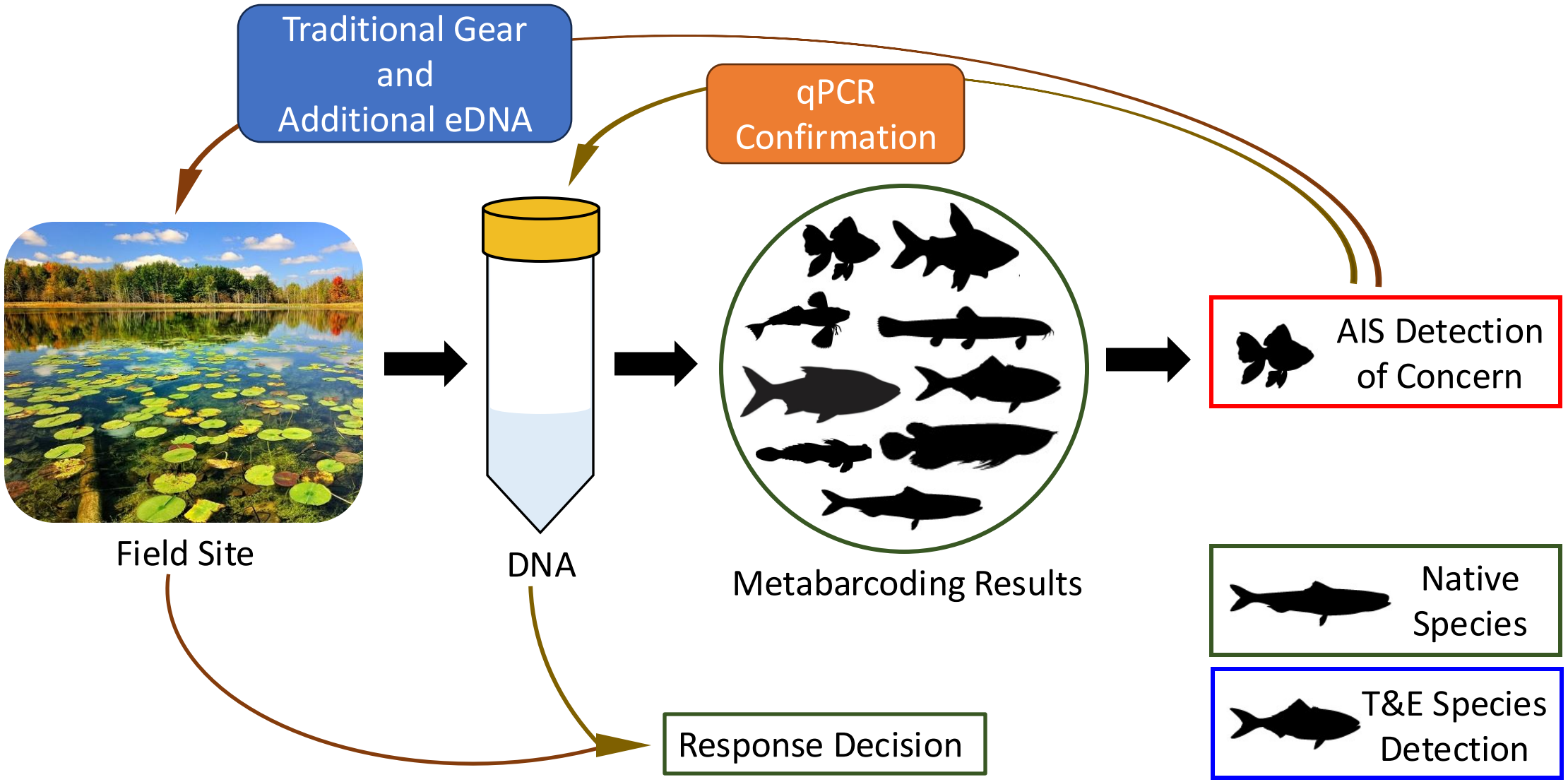




Species of interest is undetermined –

“Broad Spectrum Surveillance”

Integrated EDM: Traditional Gear and eDNA Methods



Metabarcoding

Illumina MiSeq DNA Sequencer

Metabarcoding uses generic amplification primers to guide the replication of target DNA and DNA sequencing measure the accumulation of PCR products

Environmental Sample

DNA sequences recovered from the environment

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AGCTTATTTAGCTGACCTTACTAGAAA
CCTCTGACATATTTCCCTTCCAGTGGG
ACCTACCCCAATTATTAAACTACACAA
ATTAGATATGTCTTGATGATCCCTCGT
GCGGTATTTTAACCGTGCAAAGGTAGC
CCCTTAATAGCGGCTGCACCATTAGGA
CTACTAGTGCGCCCCCTACATATGGGA
TACTACGGCTCATACCTTTACAAAGAG
GCACCATTAGGATGTCCTGATCCAACA
ACCCTATGGAGCTTTAGACGCCAACCA
ACATGCCTCAATTGAACCCCGCTCCTT
GTTAATACTCGATTGTTCAATCATCGT
GTGTAGGAACCATATAGGAGTCGAAGC
TCCCTCCCTACGAATTCTTTACCTCAT
GAGAAGGGACCTTCCAAGGCCACCACA
GTCCAGGGGTGTGATTCCTGTTGGGGG
ACGTAGGACTTTAATCGTTGAACAAAC
TTAGACGCCAACCAACCACGAAAAGCG
GATTGTGATTCCAAAGACAGGAGTTCA
GTTCCTAATGACTCAACGAGGCCCAGT
GCCTCTACCTAAACAGCCCGTAAAGCC
GAGTTAGAGGTGGGGTTTCTATGCTTT
ATTTAAAGCAGCCCTTCTTTCTGGGCT
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GCATAGAAGAATGAGTCCTAGGGCTAC
GTTAAGCTCTTTATTAAAGAACCCGTC
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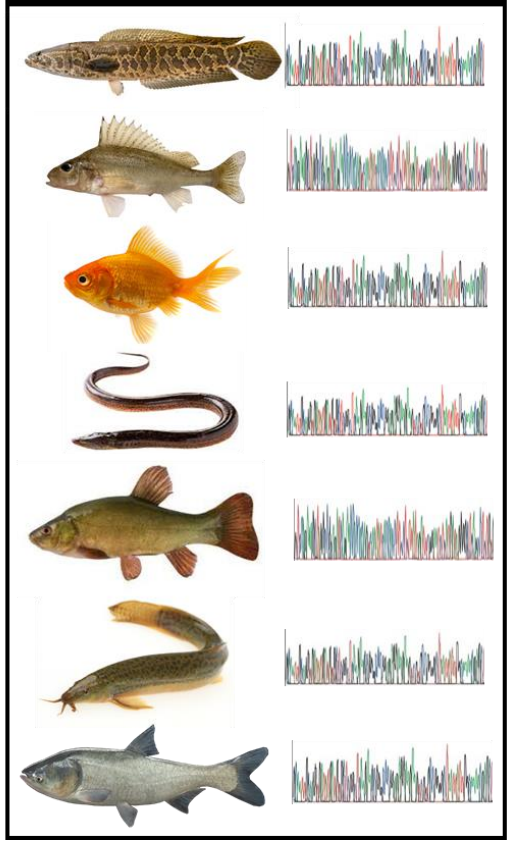
Reference database of known species



Read counts – Number of sequences matched

	Sample 1	Sample 2
Bluegill	42931	19793
Alewife	30633	11405
Gizzard shad	499	3385
Pumpkinseed	2467	19162
White sucker	0	994
Bluntnose minnow	0	0
Round goby	127	15551
Northern Snakehead	1395	0
Smallmouth bass	0	1424
Emerald shiner	0	0
Walleye	0	2983
Coregonus	0	98

Reference database is foundational to the metabarcoding effort