FishTail

A Decision Support Mapper for Conserving Stream Fish Habitats of the NE CSC Region

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Approach

1. Assemble data
2. Common spatial framework
3. Stakeholder-driven species
4. Account for natural variation

5. Score stream reaches based on fish response to:

- Land use
- Fragmentation
- Water quality
- Climate change
Stakeholder selected priority fish species for assesses the current and future risk of degradation to fish habitat

**Final species count (105 total)**

- N=63
  - Reaches 4,147
- N=75
  - Reaches 4,811
- N=76
  - Reaches 8,821
- N=85
  - Reaches 4,627
Cumulative land use

- Local catchment
- Network catchment
- Local 90m buffer
- Network 90m buffer
FISHTAIL: A decision support mapper

Fragmentation

Risk of habitat degradation due to stream network fragmentation:
- 1 - Very high
- 2 - High
- 3 - Moderate
- 4 - Low
- 5 - Very low

States boundaries are also marked on the map.
Water Quality Impairment (303d)

Cannot compare across states

- Differences between states are not necessarily due to differences in water quality. May differ due to:
  - Sampling
  - Standards
  - Designated Uses
  - Listing Approaches
Climate Change
Where are the best local catchments with lowest risk of degradation, that **will not** change class with future climate scenarios?

- Land use
- Fragmentation
- Water quality
- Climate change

Wisconsin and Michigan

Opportunities for conservation of current and future quality fish habitat

Catchments = 555
• Where are the best local catchments that **will** change class with future climate scenarios? Do they connect with quality habitat that **will not** change in the future?

- Land use
- Fragmentation
- Water quality
- Climate change

Future loss of quality fish habitat may be off-set by connectivity with habitat that **will not** change.

**Wisconsin and Michigan**

**Catchments**
- Will not change (**blue**) = 555
- Will change (**orange**) = 4,111
FishTail Mapper

https://ccviewer.wim.usgs.gov/Fishtail/
Data Gaps

1. Fine scale data!
2. Stream temperature models
3. Hydrology
4. Mechanisms
Stakeholder Involvement

1. Webinars (4) to identify priority species, feedback on results, review of mapper
2. Challenge: active engagement with a broad geographic audience/project

Stakeholder Use

1. Data public in last week
2. WI DNR: Identify possible Brook Trout reserves; review trout stocking plan
3. ETPBR LCC- expand project to entire MS River basin; better nutrient/WQ layers using SPARROW
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Upper Midwest River (MRI CGCM 2 3 2a)

Present

Future

Class E
Walleye
Logperch
Northern Pike

Class C
Channel Catfish
Common Carp
Emerald Shiner

E → C
Applications*

Which protected areas in Vermont may be best suited for ensuring the long term persistence of native fish communities?

* These types of queries can be conducted by downloading the geodatabase from sciencebase
Upper Midwest

Risk of stream class change due to future climate change:
- Very high
- High
- Moderate
- Low
- Very low
Application*

Which areas in Vermont may be best suited for ensuring the long term persistence of native fish communities?

Land use:

1. Identify locations with “low” and “very low” risk of habitat degradation in the local catchment due to land use.

* These types of queries can be conducted by downloading the geodatabase from sciencebase
Fragmentation

2. Identify locations with “low” and “very low” risk of habitat degradation due to fragmentation.
Water Quality

3. Eliminate any locations with known water quality impairments.
Climate

4. Select all streams with “Low” or “Very Low” risk of change in class due to predicted changes in climate.
Refugia

Catchments in light blue are those catchments which met the previous requirements and are likely well suited to allow for the long term persistence of the fish community.