Aquatic Connectivity

Improving stream habitats and water quality

Background

Available data

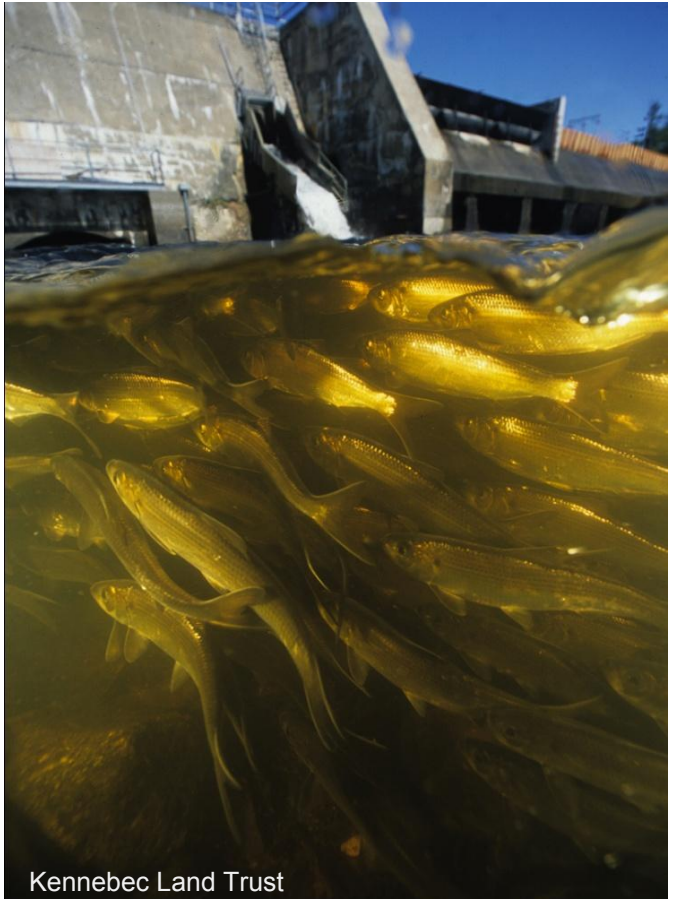
Stepwise exploration

Discussion

BACKGROUND

- *People and animals need free-flowing water in a diversity of forms*
  - *Depending on season, tide, or lifestage*

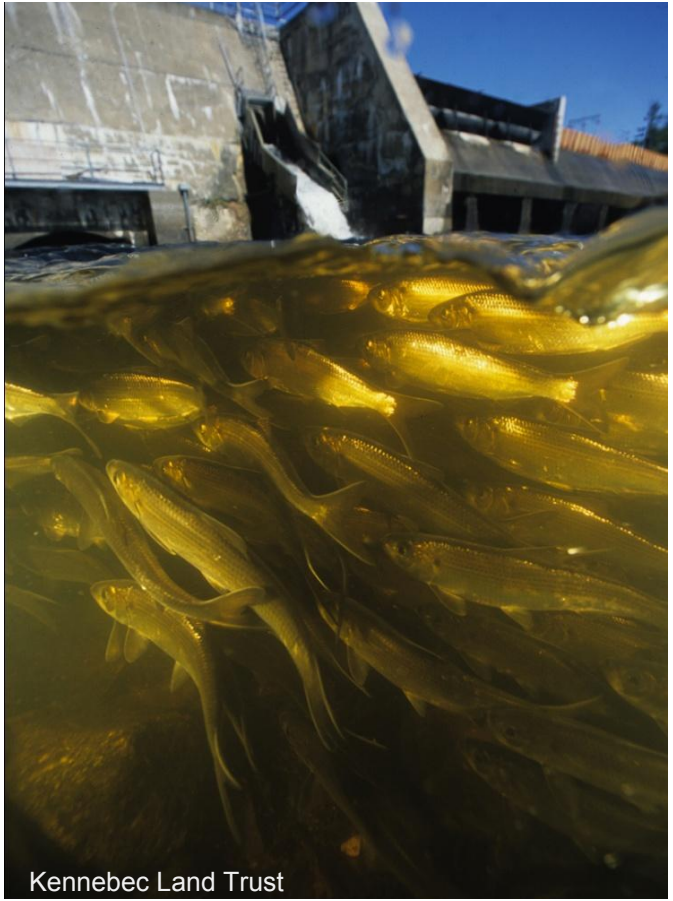
- *Structures built to cross or tap into the power of flowing water often cause problems*
  - *Barriers to migration*
  - *Barriers to genetic exchange*
  - *Poor water quality*
  - *Flooding*



BACKGROUND

- *Crossings need not hinder the flow of water, but resources for upgrades are limited - we must be strategic*

- *Identifying the most important barriers to upgrade to improve aquatic connectivity requires the consideration of many factors*

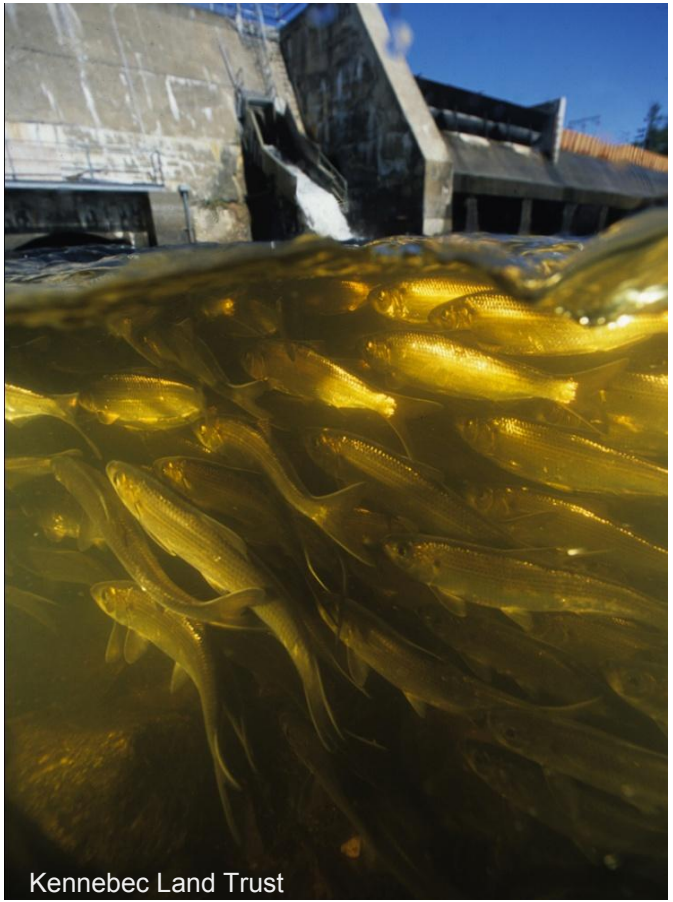


BACKGROUND

- *Several organizations have assembled data, developed models, and produced tools that integrate these variables*

- *No tool is sufficient to prioritize a barrier upgrade without expert knowledge, field visits, and clearly defined objectives*

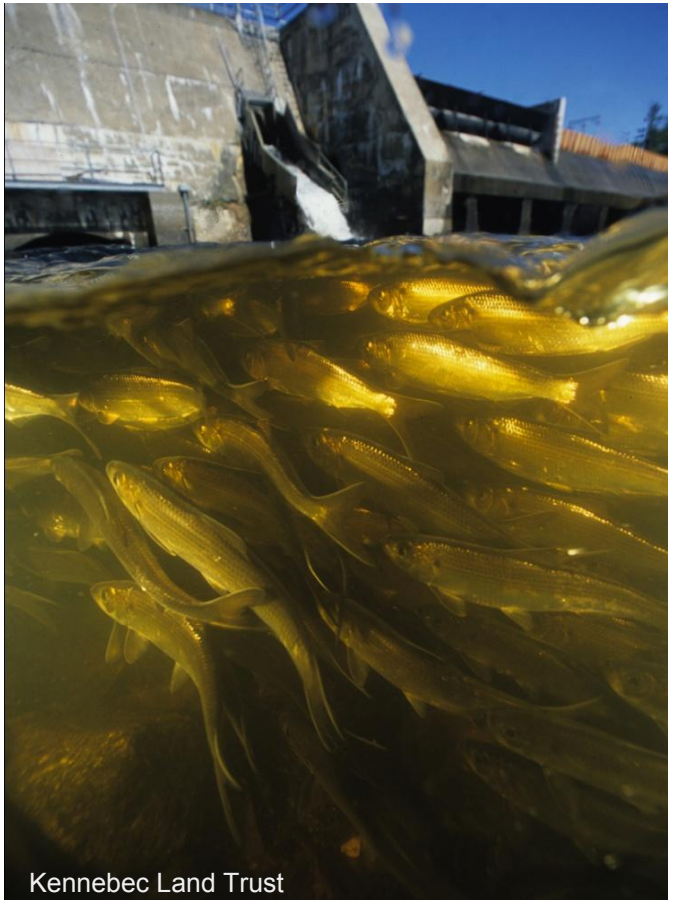
- *Using multiple tools in complement allows for the best outcome*



BACKGROUND

- *Nature's Network, within the NALCC Conservation Planning Atlas, is itself a toolset...*

- *But also maps out the many tools developed by the partners of the North Atlantic Landscape Conservation Cooperative, allowing users to build the best toolset for their conservation objectives within the framework of unified conservation action across the region.*



Outline

You are part of a team reviewing stream crossing renovation project proposals for the town of Salisbury, MA - here you will compare the possible project locations . The proposal guidance prioritizes improving passage for anadromous fish (e.g.. alewife and blueback herring, sturgeon, American Shad) through culverts and bridges in this coastal area of Northeastern Massachusetts.

Using several tools and products from the Nature's Network and partners of the North Atlantic LCC, you will compare the barriers proposed for renovation in light of how they affect aquatic connectivity and what species could benefit.

Define

Important aspects to consider

Regional Ecological Context - is the river or stream and its watershed...
- Current or past habitat for the species of interest?
- Important habitat for species of greatest conservation concern?
- Especially intact or resilient habitat, or an important buffer with strong influence on core habitat?
Relevant Tools: Nature's Network - Conservation Design, Aquatic Core Networks, Core Habitats, Terrestrial & Wetland Core-Connector Network, Important Anadromous Fish Habitat

Define

Important aspects to consider

Freshwater Network - the barrier's role in the local watershed
- Are there a diversity of types of water bodies upstream?
- Are there upstream or downstream barriers that would limit the beneficial effects?
- Does the structure impact the local community in a way that might engender support for the project (e.g. lead to flooding)?
Relevant Tools: TNC's Aquatic Barrier Prioritization, TNC's Freshwater Resilience

Define

Physical Structure - does the barrier itself...
- Alter the velocity of flow?
- Cause a bottleneck and impoundment upstream, or a scour pool downstream?
- Have an outlet drop that causes a migration barrier for species with limited jumping ability?
- Have a different bottom substrate than the streambed? Physical obstructions?
- Need to be replaced anyways due to age or deterioration?
Relevant Tools: North Atlantic Aquatic Connectivity Collaborative database, UMass' Critical Linkages - Culverts (available on Nature's Network)

Explore

Examine the factors using complementary tools

Begin by looking at the big picture:

On Data Basin, search for "Aquatic Connectivity Case Study". Select and open it to view a map with several datasets already loaded, but mostly turned off.

Explore

Examine the factors using complementary tools

Consider the aquatic context:

Open The Nature Conservancy's Freshwater Network Aquatic Barrier Prioritization Tool -

the most up-to-date version under development:

http://52.53.143.233/northeast-dev/#

Explore

Examine the factors using complementary tools

Focus on the barrier:

Select the Town Creek barrier, then "View Survey Data" in the left-hand panel to link to its North Atlantic Aquatic Connectivity Collaborative (NAACC) database entry.

Reflect

Report on the conclusion of your comparisons

- *Which proposed barrier removal project ranks highest by your assessment?*
- *What considerations supported this decision?*
- *Do you imagine some change in circumstance or goal that would lead you to select one of the other proposals instead?*
- *What other information would you like to have had, and where or how might*