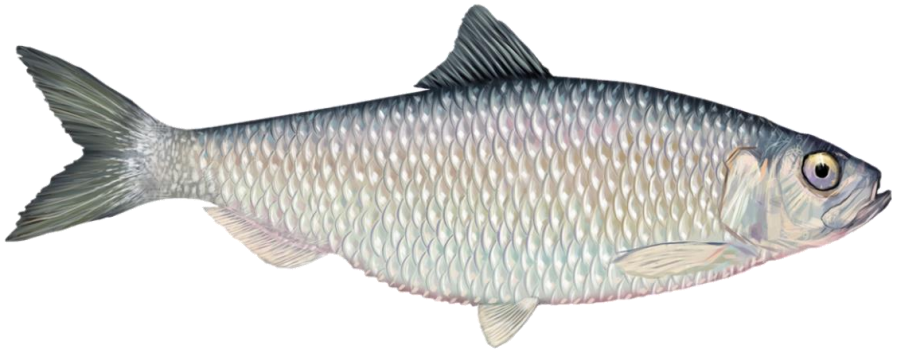
River Herring Visual Time Counts on the Exeter River, NH

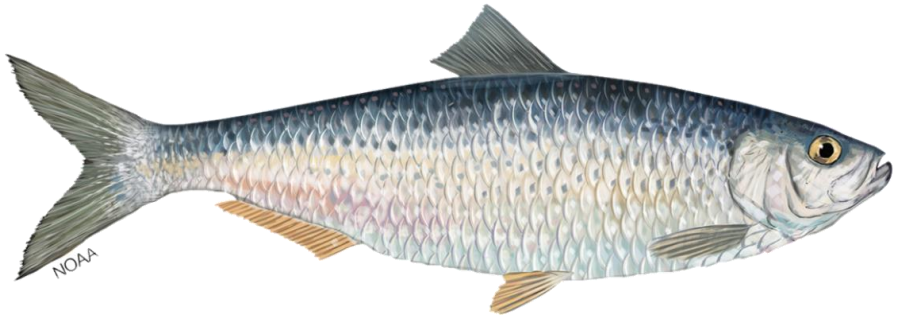
Conor O'Donnell, New Hampshire Fish and Game Department

What are River Herring?

- River herring is a collective term for 2 species -- Alewife (*Alosa pseudoharengus) and Blueback Herring (Alosa aestivalis)*
- *Anadromous herring like fish with large silvery scales, a deep body and blueish green back.*
- *Alewives have a bigger eye and are slightly larger than Blueback Herring.*
- *Spawning preference different between species (location, temperature)*

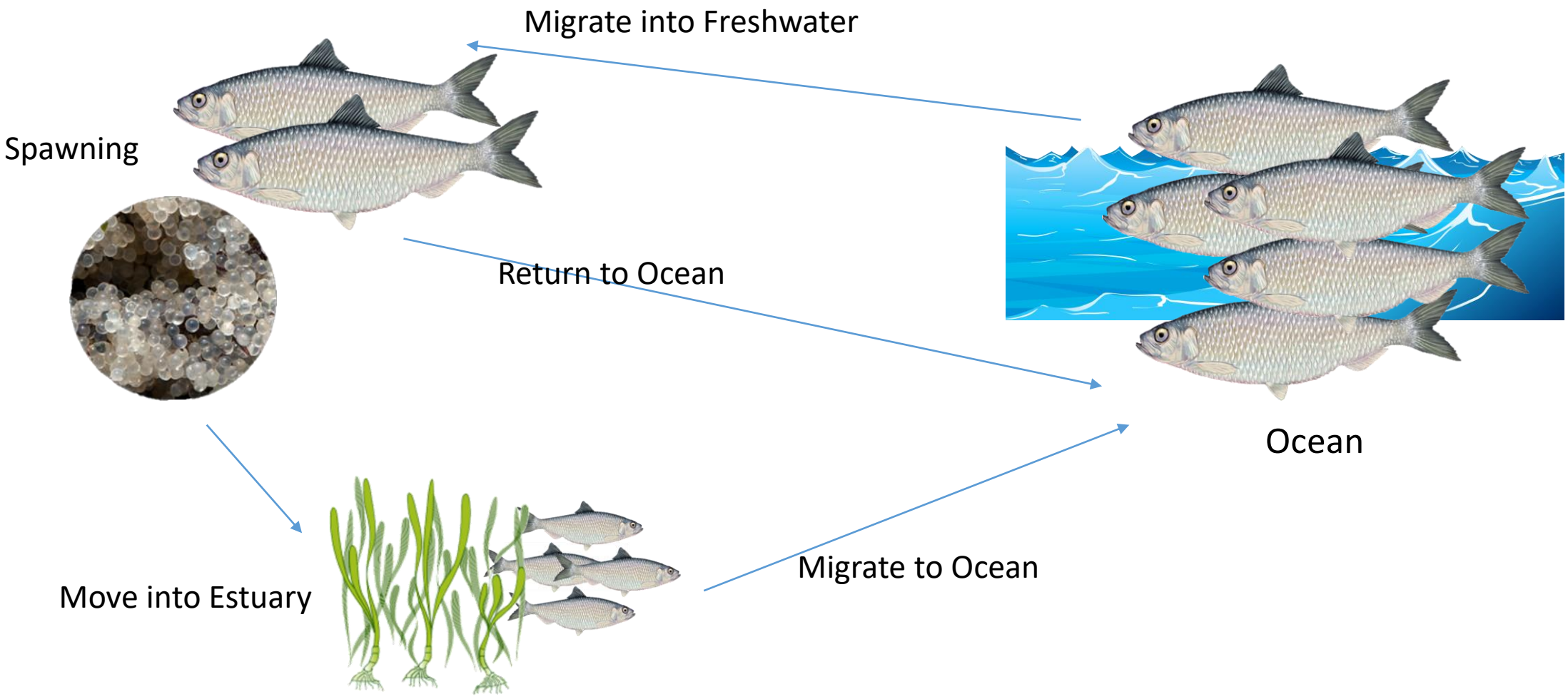


Alewife



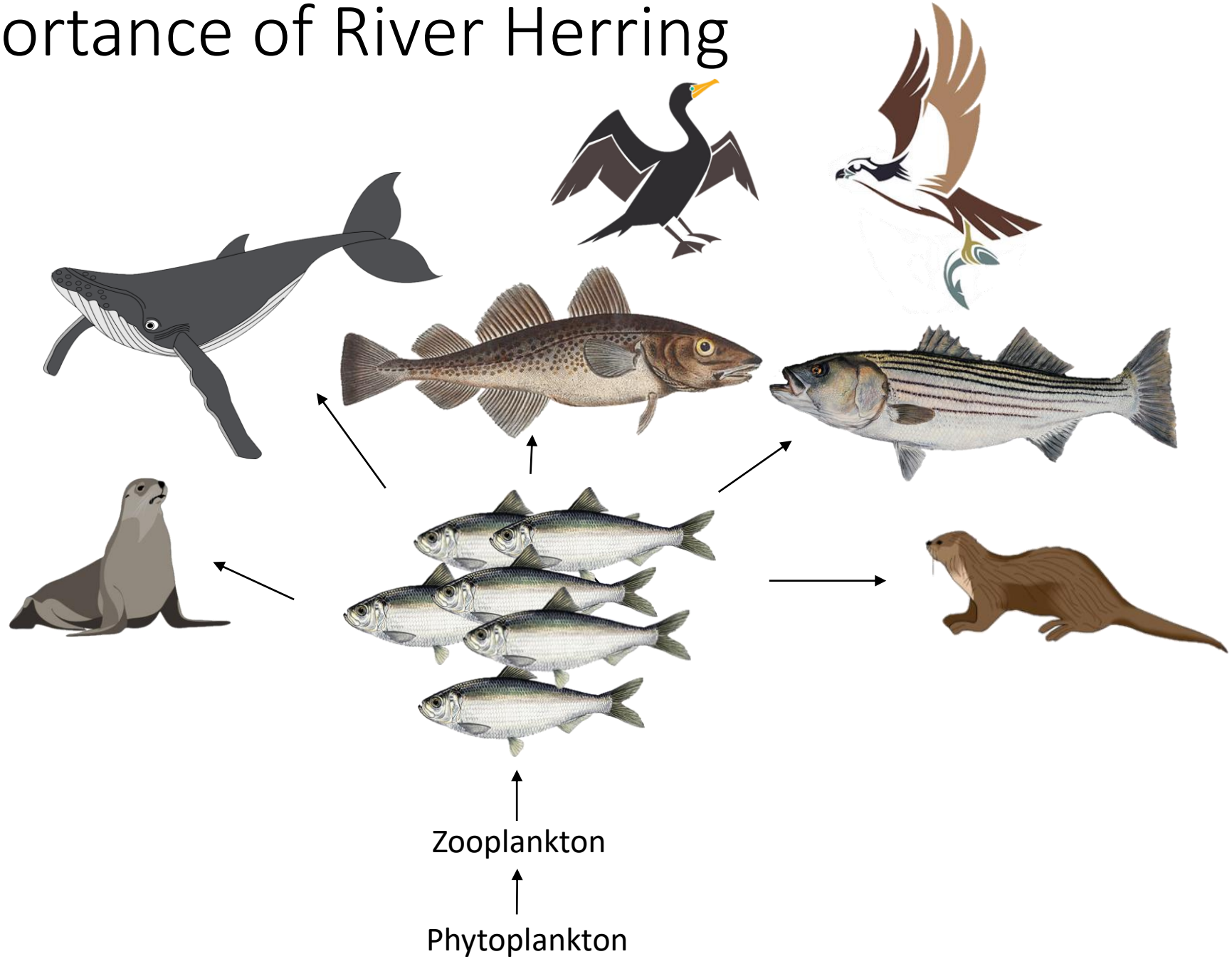
Blueback Herring

River Herring Life Cycle



Ecological Importance of River Herring

- Keystone species
- Important prey for many different fish, birds & mammals
- River herring and other anadromous fish tie our marine, estuarine and freshwater environments together
- Flow of vital nutrients up and down river systems



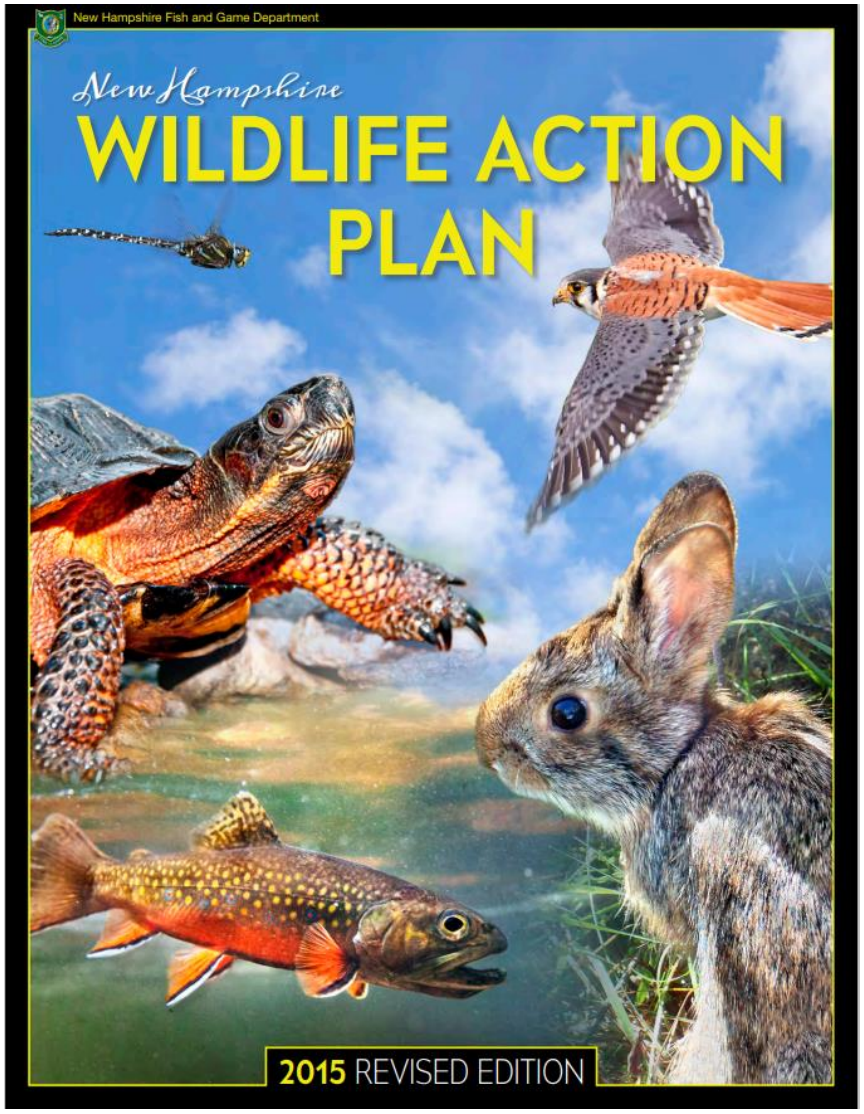
River Herring State and Federal Importance

In recent decades populations coastwide have declined drastically

River herring were a candidate species for Endangered Species Act listing in 2013 & 2019, but ultimately found to not be warranted at the time

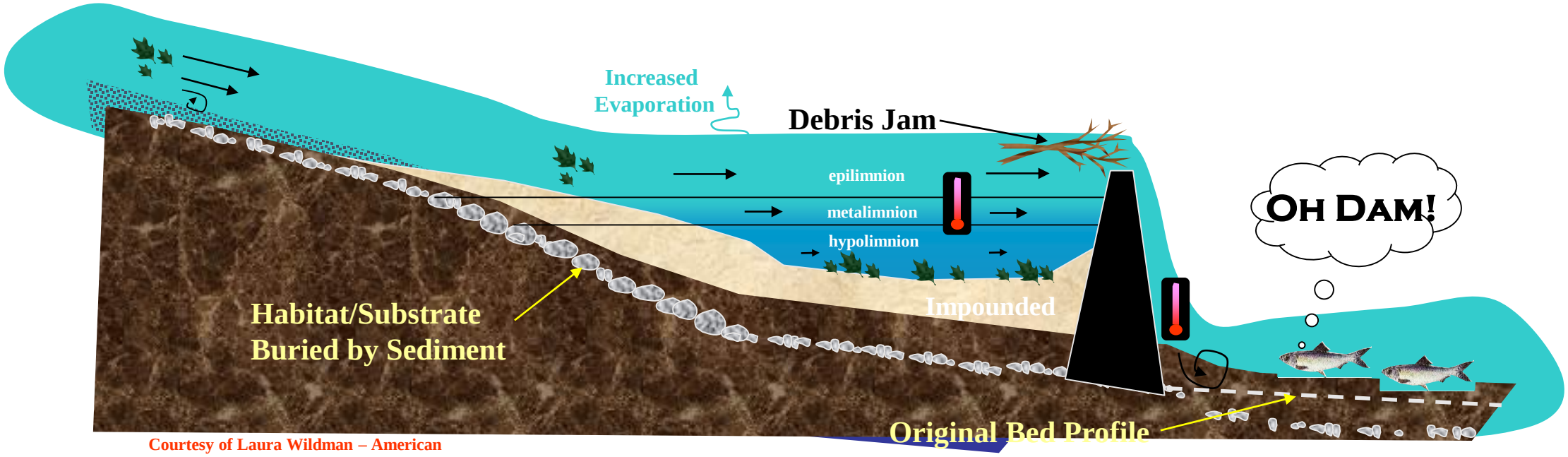
NOAA species of special concern

Both species are listed as a Species of Greatest Conservation Need in the New Hampshire Wildlife Action Plan



Threats to River Herring

- Barriers to migration (dams, culverts)
- Loss of habitat
- Poor water quality
- Pollution
- Overfishing (direct or bycatch)
- Predation
- Climate change



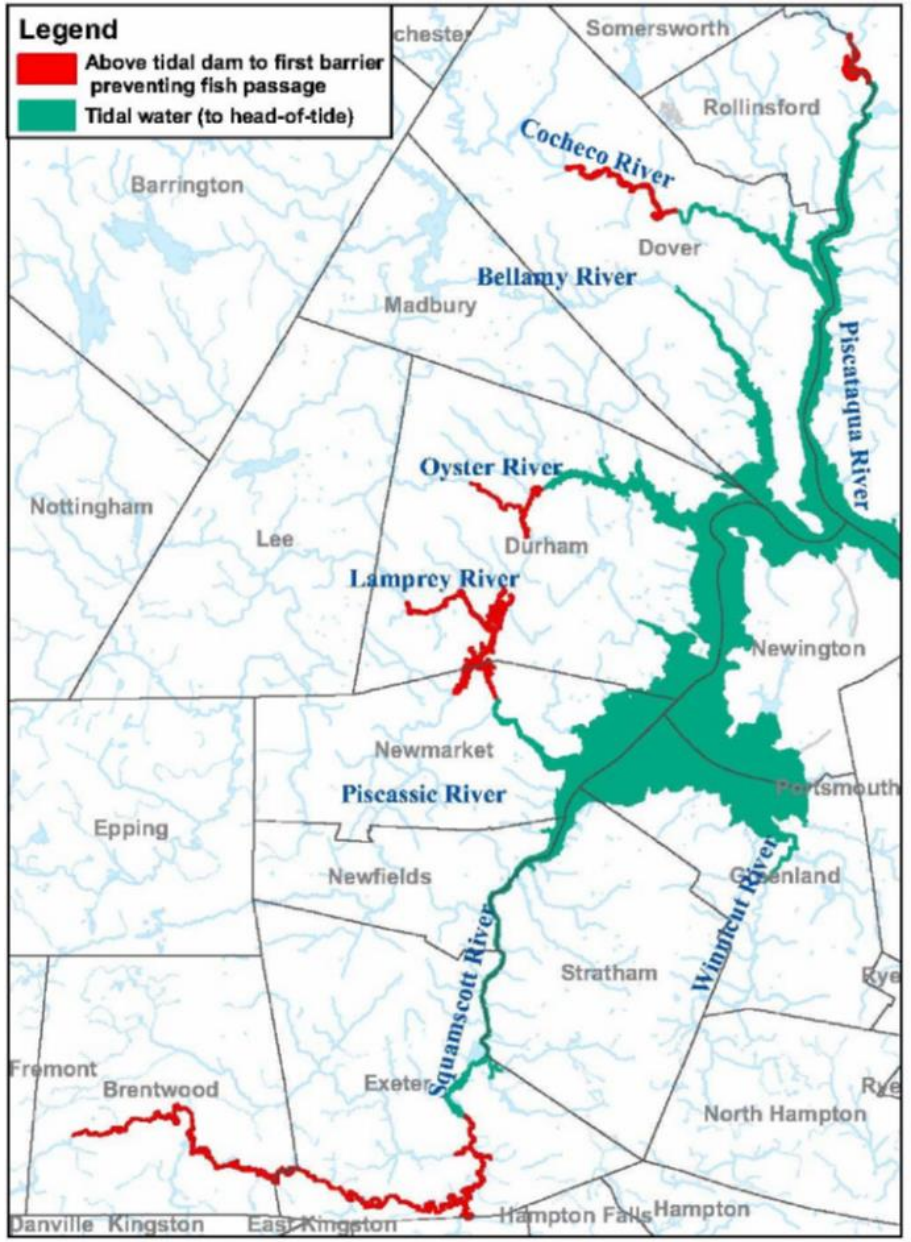
Courtesy of Laura Wildman – American Rivers

New Hampshire Fishway Monitoring

The Department annually monitors, evaluates, and quantifies fish passage along five major coastal rivers in New Hampshire

- Cocheco River
- Oyster River
- Lamprey River
- Winnicut River
- Exeter River

NH uses river herring returning to Great Bay Estuary system as an indicator of statewide herring abundance, and refer to them as the “Great Bay Indicator Stock”



Exeter Dam Removal

Summer of 2016

Pickpocket Fishway

- Pickpocket fishway on the Exeter river was modified to monitor fish passage
- Fish passage counts at the Pickpocket Dam fishway were low despite thousands of ascending river herring observed in the vicinity of the former Great Dam and fishway
- It was determined that numbers of river herring reaching the Pickpocket fishway was not providing an accurate reflection of fish migrating past the former Great Dam location

So How Do We Monitor Returns on the Exeter River Now?

Enumerating fish at the former Great Dam location using visual time counts provide a better estimation of returns to the Exeter River

Visual Time Counts

Sampling design developed by Gary Nelson, 2006

- Typically from 15-April through 15-June
- 3 time blocks

  7am-11am

  11am-3pm

  3pm-7pm
- Count fish for 10 minutes within a selected time block
- Up to 9 time counts in a single day
- Arrival times should be random

Massachusetts Division of Marine Fisheries
Technical Report TR-25

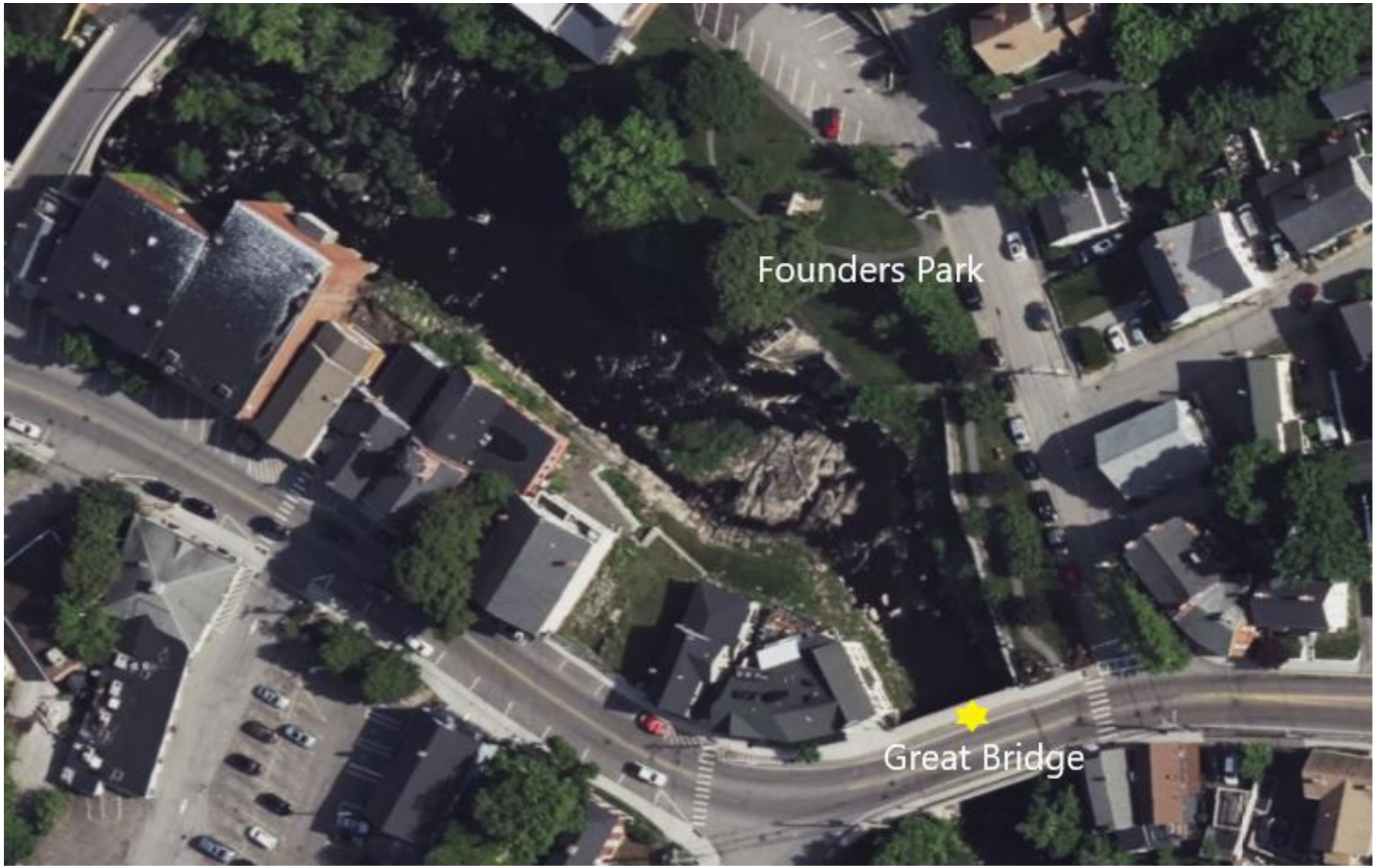
A Guide to Statistical Sampling for the Estimation of River Herring Run Size Using Visual Counts

Gary A. Nelson

Massachusetts Division of Marine Fisheries
Department of Fish and Game
Executive Office of Environmental Affairs
Commonwealth of Massachusetts

February 2006

Time Count Site Location

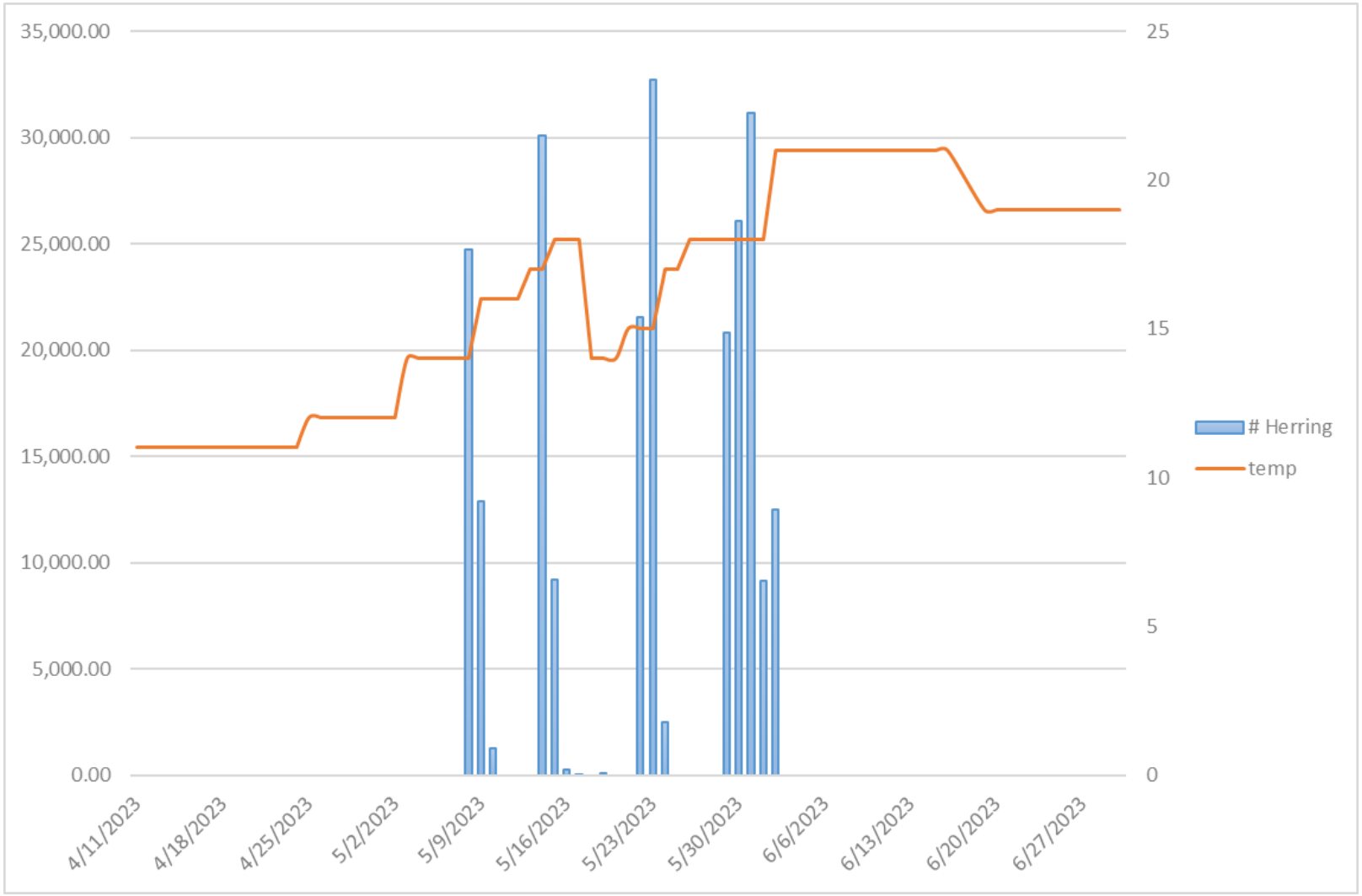


Visual Time Count Procedures

- Position yourself on Great Bridge for the best view of river looking down
- Time yourself for 10 minutes (if you happen to be there at the same time as another volunteer, please wait until they finish, wait some additional time, then start your count)
- Watch carefully and only count fish that move up pass site, subtracting fish that are moving down
- Record any other notes (weather, other fish species, predator observations)
- Enter information in your datasheet

Polarized sunglasses and a hat makes it easier to see fish!!

2023 Exeter River time counts



<u>First fish</u>
May 8th

<u>Last fish</u>
June 2nd

Important Guidelines

- Time counts should only be conducted during your selected time block.
- It is important to conduct time counts as **RANDOMLY** as possible.
- Avoid consecutive counts.
  (i.e. 11:00 – 11:10, 11:10 – 11:20, etc..)
- Avoid concentrating counts on a specific time of day.
  (i.e. always counting in the morning)
- It is important to stay for the full 10 minutes regardless of fish activity.
- River herring come in pulses, a count of **ZERO** fish is just as important.
  - **NO DATA IS DATA!!**

Volunteer Signup sheet

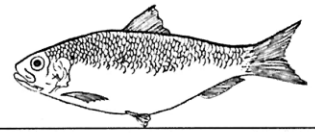
Sub Period	Coverage	15-Apr	16-Apr	17-Apr	18-Apr	19-Apr	20-Apr	21-Apr
		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
7am-11am	slot 1	NHFG	NHFG	NHFG	NHFG	NHFG		
	slot 2							
	slot 3							
11am-3pm	slot 1	NHFG	NHFG	NHFG	NHFG	NHFG	NHFG	NHFG
	slot 2							
	slot 3							
3pm-7pm	slot 1	NHFG	NHFG	NHFG	NHFG	NHFG		
	slot 2							
	slot 3							
Sub Period	**Coverage**	**22-Apr**	**23-Apr**	**24-Apr**	**25-Apr**	**26-Apr**	**27-Apr**	**28-Apr**
		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
7am-11am	slot 1	NHFG	NHFG	NHFG	NHFG	NHFG	NHFG	NHFG
	slot 2							
	slot 3							
11am-3pm	slot 1	NHFG	NHFG	NHFG	NHFG	NHFG	NHFG	NHFG
	slot 2							
	slot 3							
3pm-7pm	slot 1	NHFG	NHFG	NHFG	NHFG	NHFG	NHFG	NHFG
	slot 2							
	slot 3							
Sub Period	**Coverage**	**29-Apr**	**30-Apr**	**1-May**	**2-May**	**3-May**	**4-May**	**5-May**
		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
7am-11am	slot 1	NHFG	NHFG	NHFG	NHFG	NHFG		
	slot 2							
	slot 3							

Google sheets link

Everyone will receive the link

Click on time slot, enter name, field will turn green indicating it has been filled

9 slots available per day



River Herring Volunteer Time Count Datasheet

Year: 2024 **Name:** Joe Fish

Location: Exeter River **Email:** JoeFish@gmail.com

Record Date, Start Time, End Time and the Herring Count for **EVERY** time count. Please return datasheet at the end of the season.

Date	Start Time	End Time	Herring count	Weather	Additional Comments
5/15/24	*10:35am*	*10:45am*	*214*	*Sunny*	*Good visibility*
5/22/24	*6:24pm*	*6:34pm*	*0*	*Overcast/raining*	*Lots of bird activity, no fish seen*

For additional datasheets or questions, please contact the Division of Marine Fisheries at (603) 868-1095 or Reg3@wildlife.nh.gov

Thank you for your help