



DELAWARE CENTER FOR THE  
**INLAND BAYS**  
Research. Educate. Restore.

# Inland Bays Migratory Fish Passage Restoration Feasibility and Planning Study

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# A presentation about options and obstacles for allowing fish passage past eight dams

Purpose:

To improve the ecological health of the Bays and the recreational economy



# How do we enhance migratory fish populations in our Inland Bays tributaries?



This dam at Millsboro Pond on Route 24 represents an obstruction to spawning runs of key species in Indian River. There are **8 such dams** in the Inland Bays drainage system.

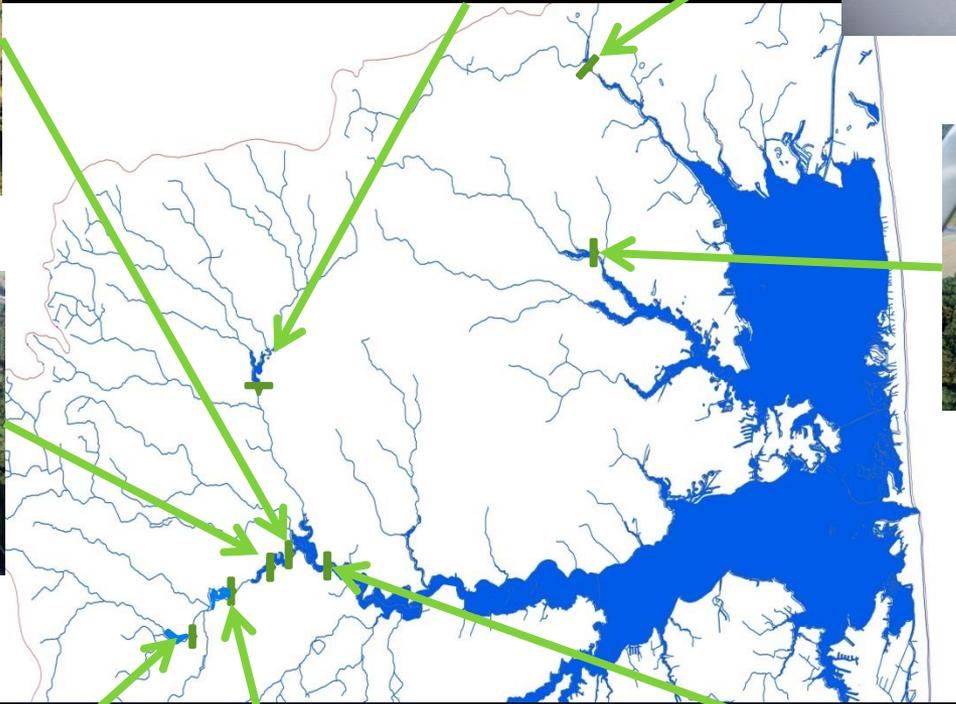
Morris Mill Pond



Goslee Pond



Lower Betts Pond



Burton Pond



Upper Betts Pond



Melvin Joseph Pond



Ingram Pond



Millsboro Pond

# These fish are in need of help



alewife - status is depressed everywhere



blueback herring – status is depressed everywhere



hickory shad – status unknown, adults locally abundant at Indian River Inlet



American eel – status depleted coastwide, though elvers abundant in Indian River



striped bass – status restored, but very little spawning in Inland Bays



# What can be done to increase access to spawning areas for these important species?

Contractors (Andrews-Miller and their subcontractor Versar Inc.) were hired to conduct a feasibility study



**Andrews, Miller & Associates**

A Division of Davis, Bowen & Freidel, Inc. of Easton, MD. - architects, engineers, planners, surveyors, and graphics specialists with extensive Delaware experience



**VERSAR**

A world-wide environmental and construction management company with Delmarva experience evaluating fish passage alternatives

# Modeling Approach

**Assign values for each biological and physical metric used and then rank them from 1 to 8:**

- **Biological metrics:**
- Calculate Habitat Suitability Index values for hickory shad, alewife, blueback herring, American eel. In other words, how suitable would the pond and upstream be for the species being considered for restoration?
- **Physical Metrics:**
- Distance of each dam to Indian River Inlet.
- The order of each dam on the particular stream system.
- Upstream distance that would be accessible if a passage device is installed.
- Relative cost of each passage device to be installed at each dam.
- Metric for type of ownership of a dam (public or private).
- Metric for condition of each dam.

Average the biological ranks and the physical ranks, then add them together and divide by two so that neither the biological nor physical metrics carry more weight. Ranks for herring and shad and for eels were kept separate.

# Some of the recommendations in the report to the CIB

1. Install an aluminum Alaska steppass-type fish ladder at Millsboro Pond dam and Burton Pond dam like this one at Coursey Pond Dam & Silver L, Milford.



2. Make eel ladders already in place at Millsboro and Lower Betts Pond dams operational again to pass elvers upstream.



eel elver



Breach dam at Upper Betts Pond to allow fish passage between the two ponds, provided passage is installed at the lower Betts dam.



Install eel ladder at Goslee Pond dam



# How much will it cost?

Alaska Steeppass fish ladder = ~\$230,000 for Millsboro Pond dam ladder for permitting, materials and installation. ~\$195,000 for Burton Pond.

Eel ladders newly installed = ~\$3,000 each for materials, installation, and permitting.

Less \$\$ for making the 2 existing eel ladders operational.

Operation and maintenance are additional costs.

# Ranking summary

- **Passage for fish other than eels**

1. Millsboro Pond (tied)
1. Burton Pond (tied)
3. Betts Pond lower
4. Betts Pond upper
5. Ingrams Pond
6. Morris Mill Pond
7. Shoals Branch Pond
8. Goslee Pond

- **Eels**

1. Goslee Pond
2. Millsboro Pond
3. Betts Pond lower
4. Burton Pond
5. Morris Mill Pond
6. Betts Pond upper
7. Ingrams Pond
8. Shoals Branch Pond

# What are the potential ecological benefits?

The food web in the Inland Bays and Atlantic Coast will benefit



Fishermen will benefit



# Other Beneficiaries?

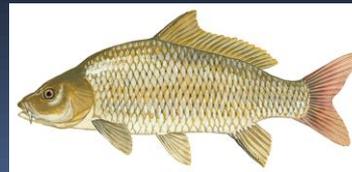
- Predatory species - largemouth bass, chain pickerel, and black crappie to name a few freshwater species, plus saltwater predatory species.
- Invertebrate species - freshwater mussels depend on migratory fish to disperse their early life stages upstream. Example: the alewife floater, a species in need of conservation action.



- School children – educational opportunities are provided by site visits to fish passage devices.

# Obstacles?

- Access to the dams and the cooperation of the dam and pond owners.
- Costs.
- Permitting, at local, state, and federal levels.
- Labor to operate and maintain any devices installed.
- Passage by non-target species like gizzard shad and carp.



# How could passage by non-target species be prevented?



Fish traps at the outlet to the ladder like this one at Garrison Lake are labor intensive and would require daily maintenance.

## Project Timeline

**Oct. 1, 2013** – Contractor began gathering information.

**By mid-Jan. 2014** – Developed species habitat indices & ranked potential fish passage sites.

**Feb. – Mar. 2014** – Convene a working group, approve rankings.

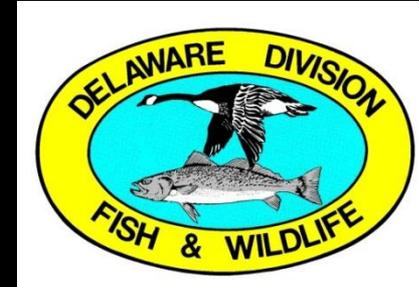
**Mar.-Apr.** – Draft fish passage plan.

**Apr. 30** – Final Plan for restoration of fish passage in the Inland Bays system is drafted.

**June 30** – Implementation phase.

Schedule dependent on working group recommendations and available funding.

# Where might the money come from?



State funding and federal aid administered by these agencies

Federal aid funds administered through DNREC

Potential private funding sources:

- Mitigation funds from road construction, NRG, NRCS, NRDA, others?
- American Rivers, TNC?
- Private donations

# Why is this the best option for restoring these fisheries?

- Once migratory fish runs are re-established, they would be self-sustaining.
- There would be benefits up and down the food chain.
- Aside from controlling fishing mortality, it is about all we can do for these important species.

# What is the ultimate goal?

- Restored spawning populations of river herring, hickory shad, and American eel in the Inland Bays system.

# How can you help make it happen?

- Urge DELDOT and DNREC to make restoration of these fish runs a priority.
- Insist that any future roadwork that impacts these ponds or their dams include funding for retrofitting of fish passage. Example: Route 113 by-pass scenarios that will cross any of the ponds or their drainage areas.
- Contribute to required local match to federal grants. Example: your contribution to Center for the Inland Bays could be used to match funds for enhancing fish passage.
- If you own one of the ponds in question, grant access for the purpose of retrofitting fish passage. If you live on one of the ponds, urge the owner to support fish passage.

Questions?