Culvert Regulations for Fish Passage in Ossining, NY

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Objective: To advocate for regulations insuring that culverts (and dams) allow for fish passage.

- **Introduction:** Why do we need regulations?
- **One local example:** Town of Ossining, NY. Culvert and Dam regulations
  - The Sing Sing Kill. Our local stream.
  - How do the 2015 culvert regulations read?
  - How SHOULD they read?
  - What was the process?
  - What were the obstacles?

Why do we need culvert design regulations for fish passage?

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- Small streams & small animals – Important but ignored

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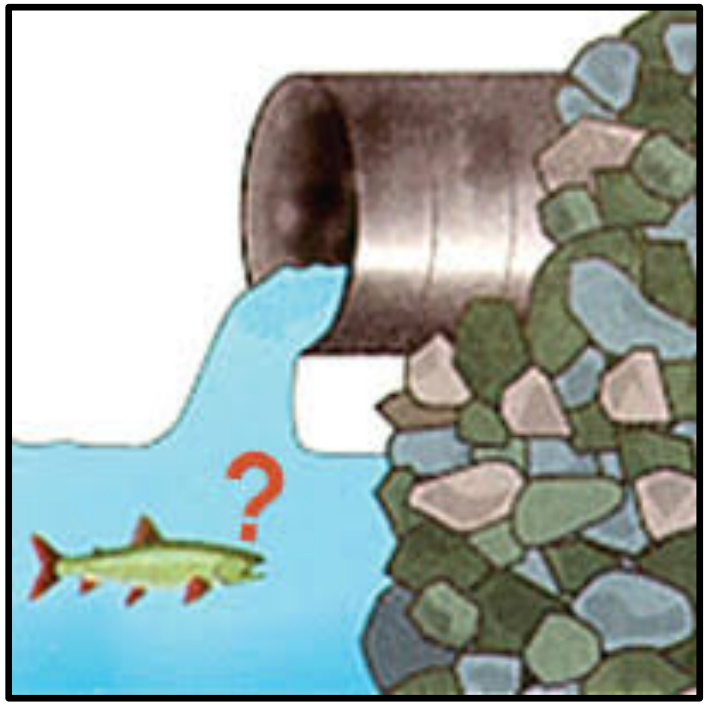


The Sing Sing Kill.

Under the Double Arches of the Croton Aqueduct

River keeper Sweep 2019
Sing Sing Kill

Village Stash the Trash Day --Sing Sing Kill cleanup, 2017

2016 – Sing Sing Kill ecology and culvert characterization

Rotary Duck Race 2015

Run semi-annually in the Sing Sing Kill.

Local code regulations in the Town of Ossining, NY.

Chapter 105. Freshwater Wetlands, Watercourses and Water Body Protection

B.

(4)

All proposed culverts and dams meet the guidelines of the New York Department of Environmental Conservation for the migration of aquatic wildlife, if applicable.

[Added 12-15-2015 by L.L. No. 7-2015]

(5)

Pipes installed to convey a watercourse shown on the USGS maps or classified by the New York State Department of Environmental Conservation as A, B or C will require culverts designed in accordance with the stream crossing guidelines document published by the New York State Department of Environmental Conservation.

[Added 12-15-2015 by L.L. No. 7-2015]

What is wrong with these two regulations?

1) **105-B-4 refers to "proposed culverts and dams".** This implies only new ones are regulated.

2) **105-B-4 uses the final phrase "if applicable".** It should be considered always applicable.

3) **105-B-4 refers to "culverts and dams**" BUT fish passage over dams are not covered in the DEC stream crossing guidelines.

4) **105-B-5 applies only to streams of class A,B and C.** They should apply to all culverts. Even for intermittent streams and ditches

5) **Both require looking up the DEC guidelines.** The guidelines should be included in the regulation.

What was the process for enacting these laws?

1) Becoming aware of the problem ourselves. Thank you DEC.

2) Getting a GOAL of fish passage for local streams into the TOWN COMPREHENSIVE PLAN.

3) Educating the public and local politicians.

    - “Discover Your Streams” program to bring local streams out of anonymity.

        - Ecology research: e.g. Discovery of 9 species of fish in the SSK shocked many people.

        - Village fair culvert demo. FUN

        - Engaging interpretive signage with fish images, local history, art

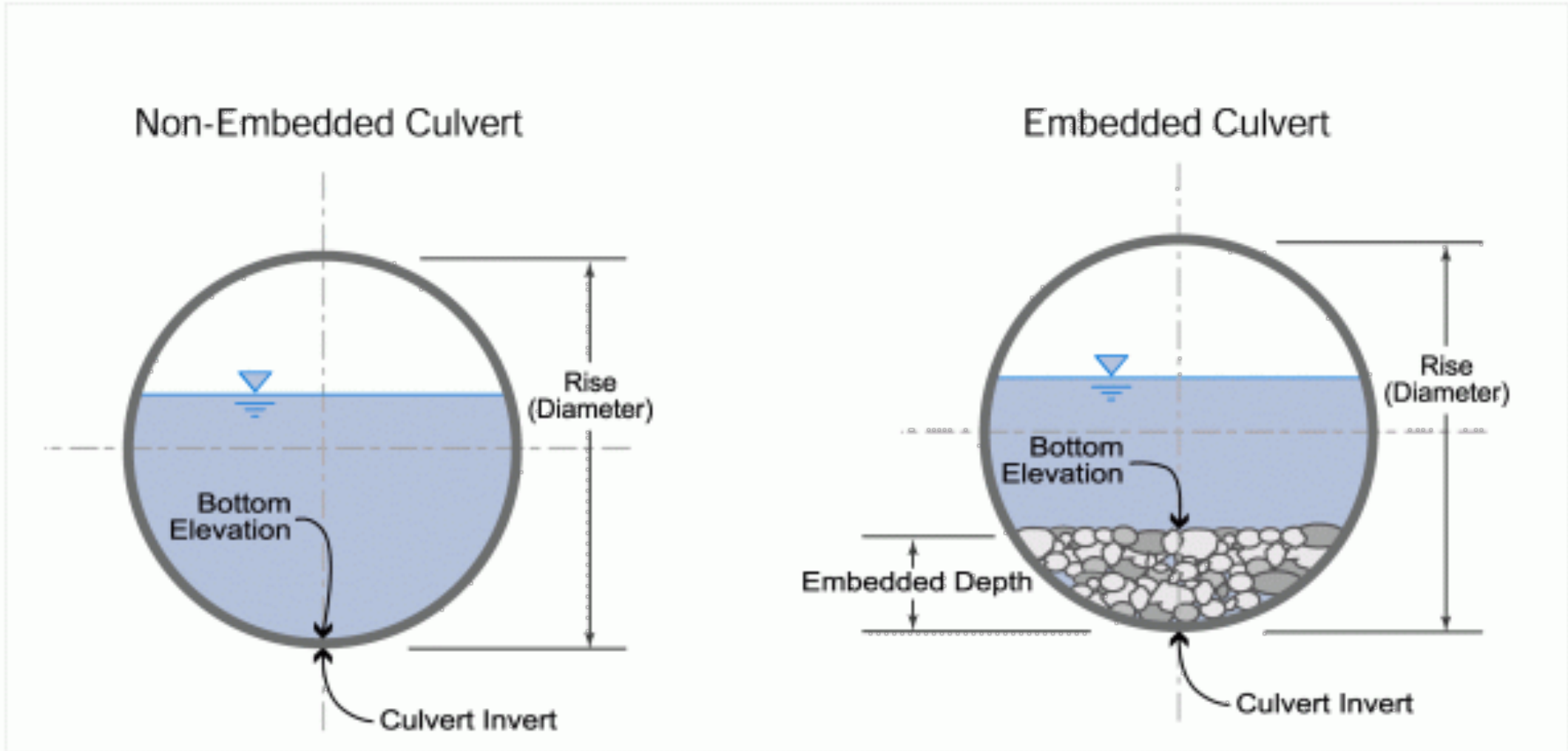
4) Proposal to the Town Board

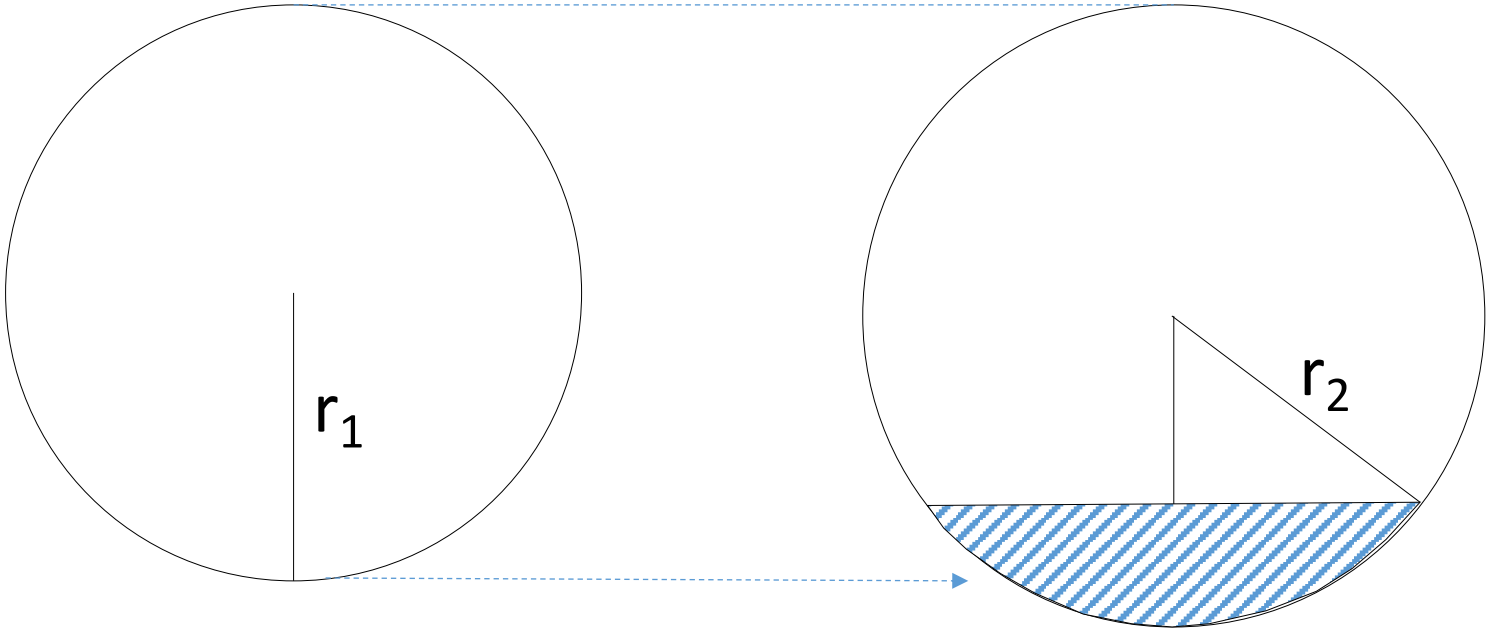
What were the obstacles?

1) Lack of knowledge re connection between small fish in small streams and a heathy fishery of big fish in ocean.
2) Assumption that acceptable culvert design will have high cost.
3) No strong opposition, just that environmental issues are political bottom feeders. Low priority for local leaders

What were the obstacles?

We need to get fish passage requirement to become second nature to storm water engineers.


Non-Embedded Culvert
Rise
(Diameter)
Bottom
Elevation
Culvert Invert
Embedded Culvert
Rise
(Diameter)
Bottom
Elevation
Embedded Depth
Culvert Invert



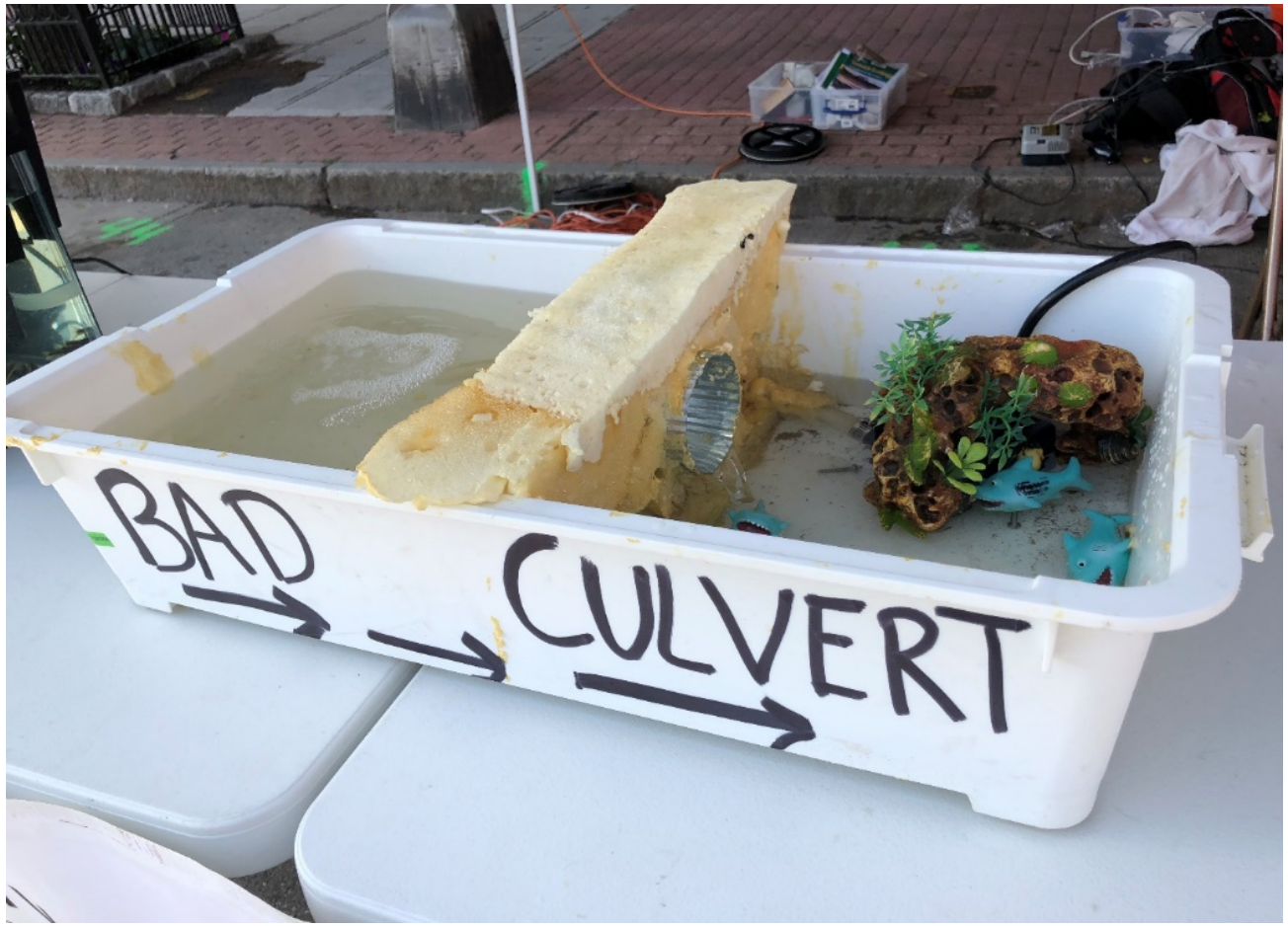
$$\frac{r_2}{r_1} = 1.0798$$

Only 8% larger diameter needed

Educating the Local Leaders:

Culvert Demo at Village Fair

Good culvert design. Fish can swim from downstream to upstream.



Demonstration of a bad culvert design wrt fish passage. Culvert is perched, fish cannot pass upstream to spawn.


JULIE
Squirts

Alewife (*Alosa pseudoharengus*)

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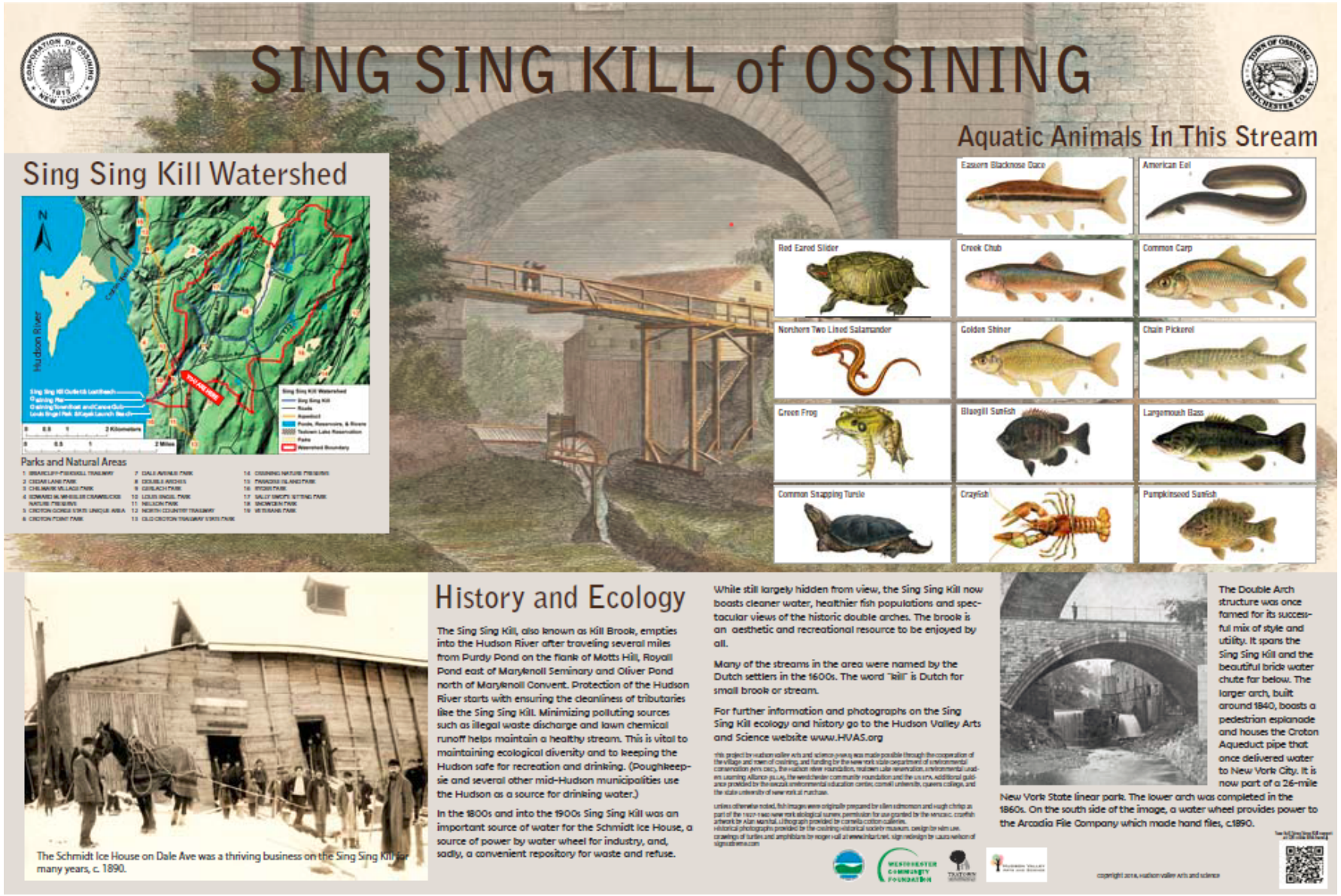
Demonstration of a bad culvert design for fish passage. Culvert is perched, fish cannot pass upstream to spawn.

Educating the Local Leaders:

Engaging Interpretive Signage



HOW SHOULD THE OSSINING LAWS READ?:

Initial thoughts on improvements to the Ossining language:

Town of Ossining, Westchester County, NY. , New York Model Fish Passage Ordinance [2019]

Title

This ordinance shall be known and may be cited as the “Fish Passage Ordinance of the The Town of Ossining.” This should be added to the Wetland ordinance section.

Purpose

The purpose of this ordinance is to establish requirements for creating and maintaining fish passage to protect & restore aquatic connectivity for aquatic organisms in the streams of the Town of Ossining in Westchester County, NY. This ordinance promotes the protection and restoration of stream continuity (as well as infrastructure protection through prevention of scour and flooding) by ensuring that installation of all stream crossings (e.g. culverts and dams) are designed in accordance with the New York State Department of Environmental Conservation (NYSDEC) stream crossing guidelines. Research has shown that following these minimum guidelines will avoid stream fragmentation and ensure that iconic migratory fish species such as American eel and river herring will have access to critical habitat.

HOW SHOULD THESE READ?: (cont.)

105-8-B 4:

All proposed culverts are to meet the Stream Crossing guidelines of the New York State Department of Environmental Conservation to allow for the upstream and downstream migration of fish and other aquatic wildlife ("guidelines"). https://www.dec.ny.gov/permits/49060.html.

All existing culverts for which major modifications are proposed are to meet these DEC guidelines at the time of construction.

105-8-B-5:

Pipes installed to convey any watercourse will require culverts designed in accordance with the Stream Crossing guidelines of the New York State Department of Environmental Conservation to allow for the upstream and downstream migration of fish and other wildlife.

This requirement is not to be limited to streams of a certain size or class designation. Intermittent streams or drainage ditches that connect to perennial waterways or wetlands are also subject to these requirements.

THE GUIDELINES:

The following recommended standards are effective for reducing stream barriers and impediments to fish and wildlife.

I. Type

A. Bridges and bottomless arches are preferred and should be used whenever possible.

B. Box and Pipe culverts, if used, must be:

- Embedded into the streambed to at least 20 percent of the culvert height at the downstream invert.
- Used only on "flat" streambeds (slopes no steeper than 3 percent)
- Installed level

II. Width

The crossing opening (whether open arch, bridge, or culvert) should be at least 1.25 times the width of the stream channel bed. This width is measured bank to bank at the ordinary high-water level (ohwl) or edges of terrestrial, rooted vegetation.

An average of three measurements, (project location and straight sections of the stream upstream and downstream) should be used to determine the channel bed width.

III. Depth and Velocity

At low flows, water depths and velocities should be the same as they are in natural areas upstream and down stream of the crossing.

IV. Substrate Natural substrate should be used within the crossing, and it should match the upstream and downstream substrates. It should resist displacement during floods and should be designed so that appropriate material is maintained during normal flows.

HOW SHOULD THESE READ?: (cont.)

Although it is not regulated in this ordinance (article), the Town of Ossining strongly encourages the use of the USDA's "Stream Simulation" approach to designing road-stream crossings, in order to provide optimal fish passage and promote natural stream processes.

108-x-x:

All new dams or proposals for dam renovations must be passable by fish and other aquatic wildlife.

Summary:

- Educating local leaders critical.
- Bring small streams out of anonymity. E.g. “Discover Your Streams”
- Goals for fish passage should be included in local comprehensive plans.
- Enact local regulations for fish passage.

Acknowledgements:

- NYSDEC Hudson River Estuary Program
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- Village of Ossining