

Dana Dam Removal (aka Strong Pond Dam)

Norwalk River – Merwin Meadows Park, Wilton, CT

**CONNECTICUT
ASSOCIATION OF
WETLAND SCIENTISTS**

**2024 ANNUAL
MEETING**

March 7, 2024

Alex Krofta

*Ecological Restoration
Projects Manager*





Save the Sound[®]

Action for our region's environment.

Save the Sound leads environmental action in the Long Island Sound region. We fight climate change, save endangered lands, protect the Sound and its rivers, and work with nature to restore ecosystems.



Pollution Monitoring



Legal Action

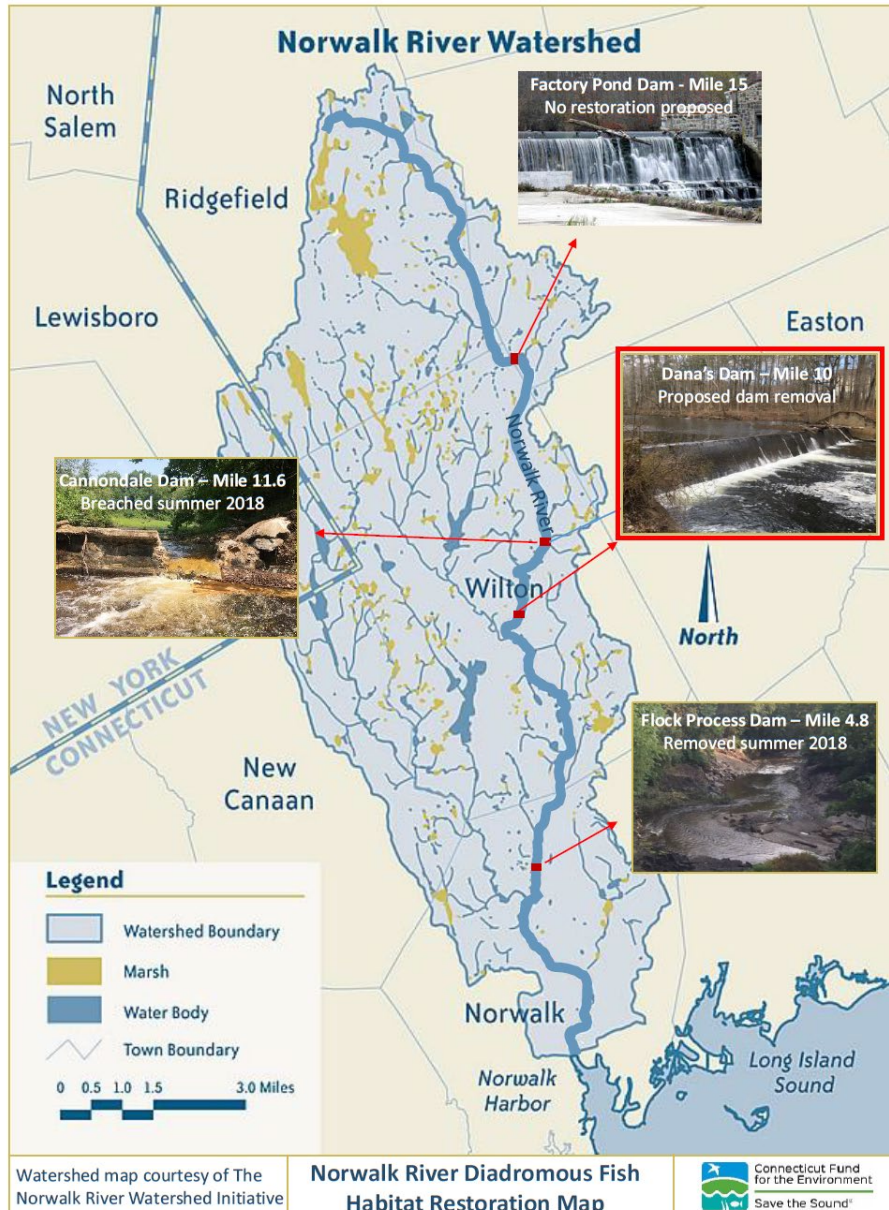


Legislative Advocacy



Ecological Restoration

Norwalk River Watershed Context



Previous dam removals

- Flock Process Dam 2018 (downstream)
- Cannondale Dam 2018 (breach, stabilized - upstream)

Dana Dam removed

- +5 upstream mainstem miles of habitat (approx)
- +5 upstream tributary miles of habitat (approx)
- = 20+ miles of connected river habitat to Long Island Sound

Social Context

- Trout Unlimited, NRWA, Wilton, and other local advocates
- CT DEEP, EPA, NFWF, USFWS, Richardson Fnd, generous private donors



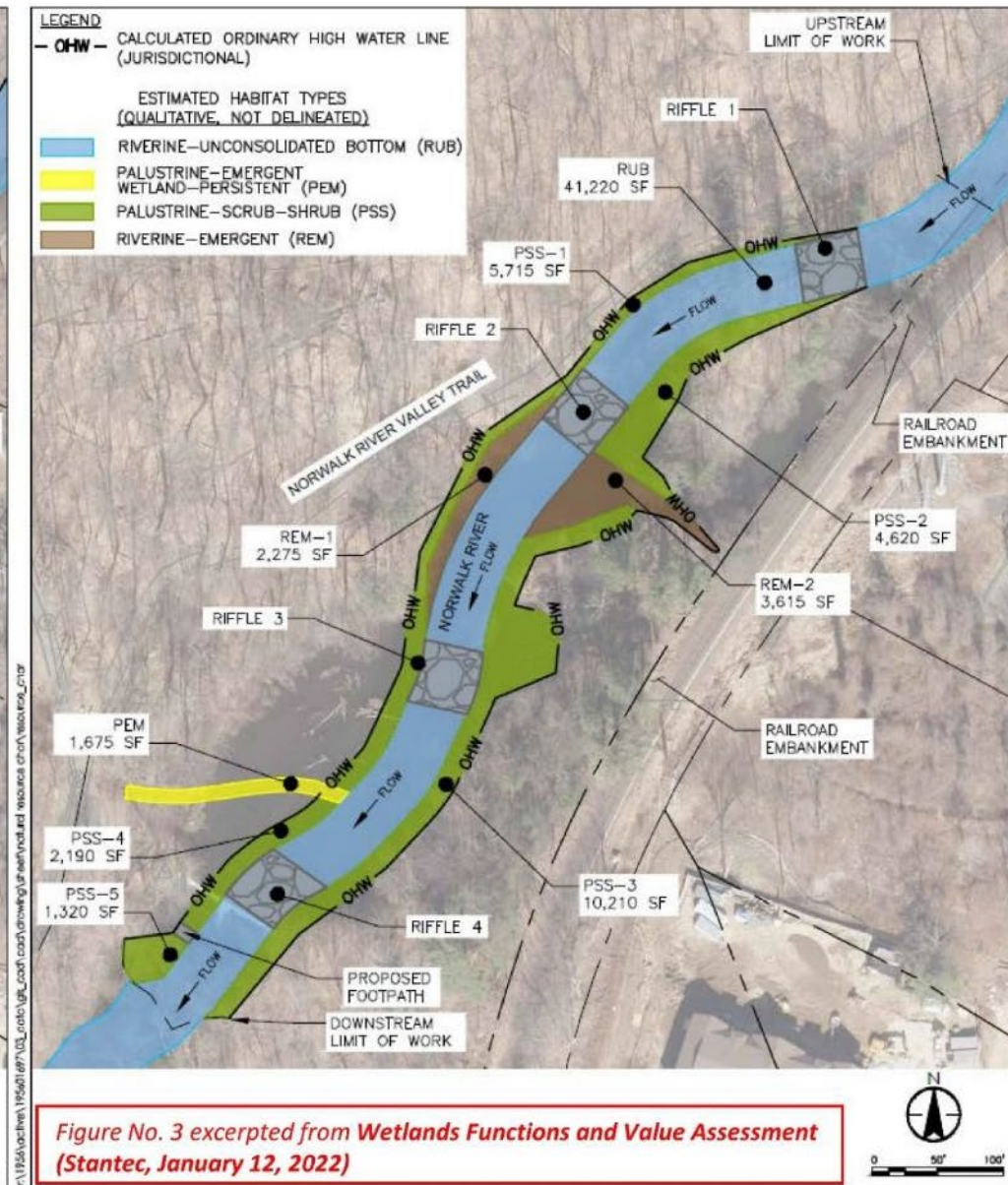
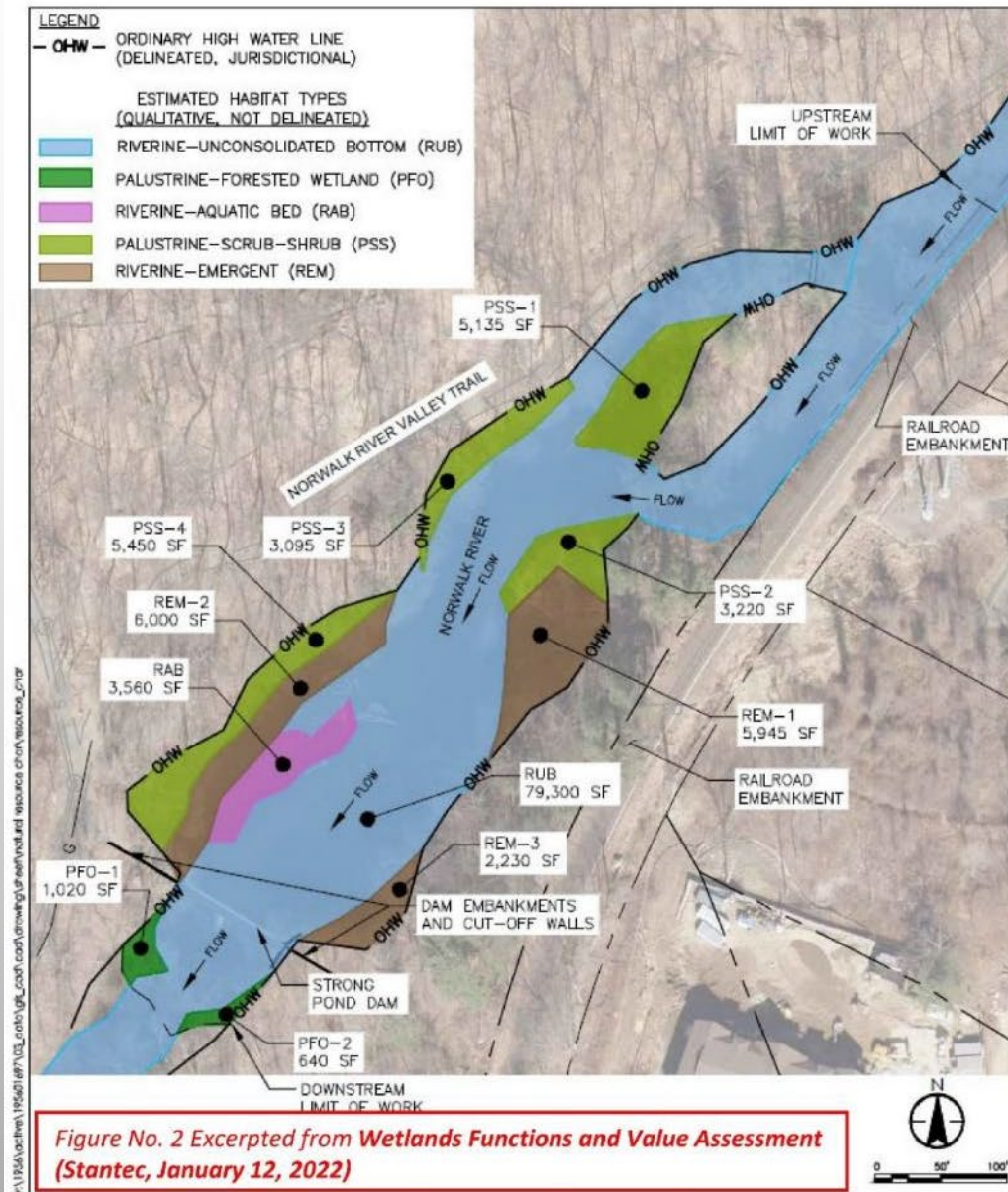
Dana Dam Removal Design: bird's-eye view

BEFORE:

- 1.5 acre impoundment
- Slow-moving run-of-river, <1'-6' depths
- Small upstream island
- Primary channel along railroad embankment
- Wetlands: mostly open water, with aquatic bed, riverine emergent, scrub-shrub wetlands

AFTER:

- Single-thread channel, realigned away from RR
- Pools (2'-4' depths) and "riffles"
- Wetlands: net loss, *but* creating/retaining riverine emergent, emergent, scrub-shrub
- New riparian buffer: 1.08 acre



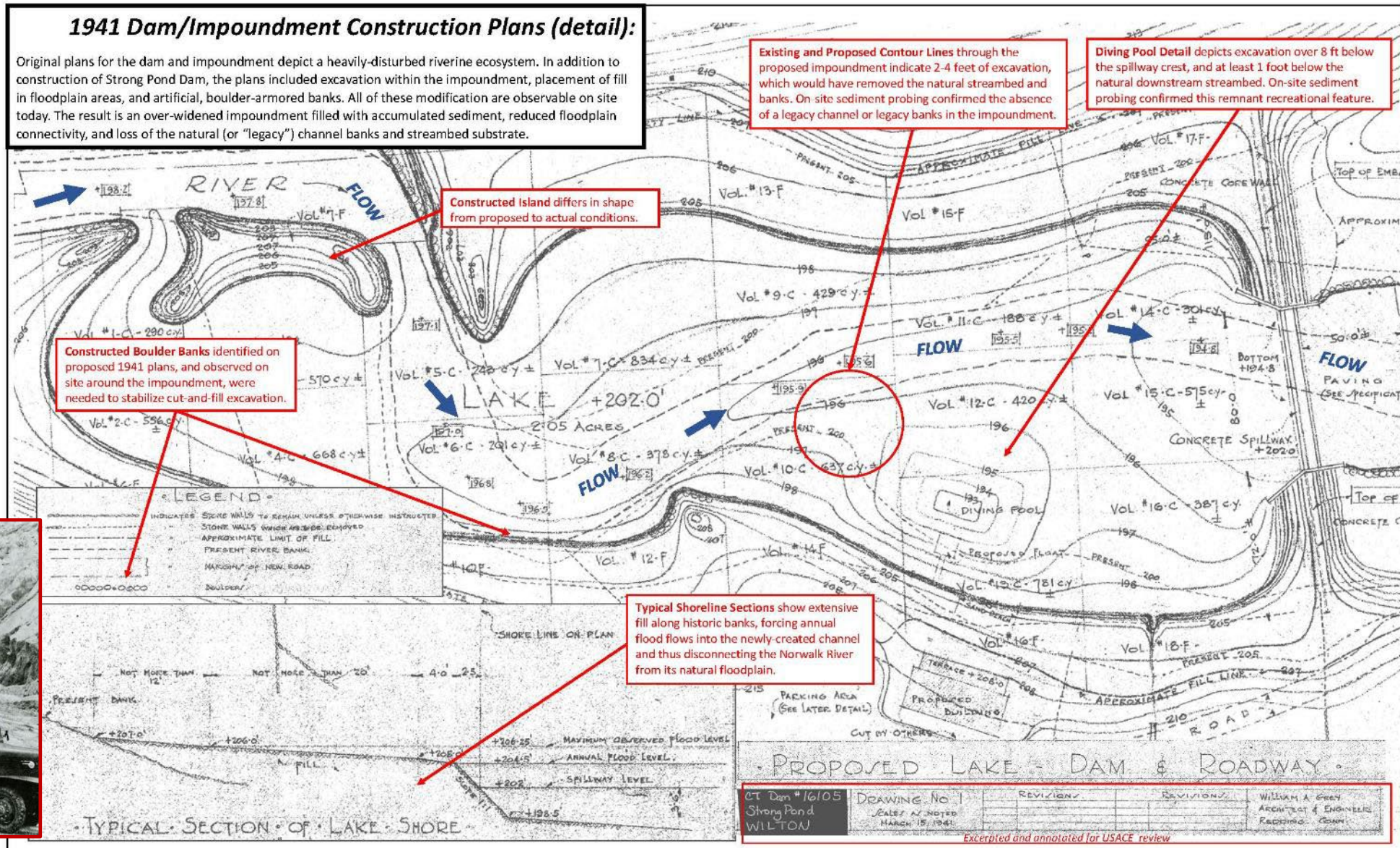
Dam Removal Design: longitudinal profile

Dam Removal Design: active v passive restoration?

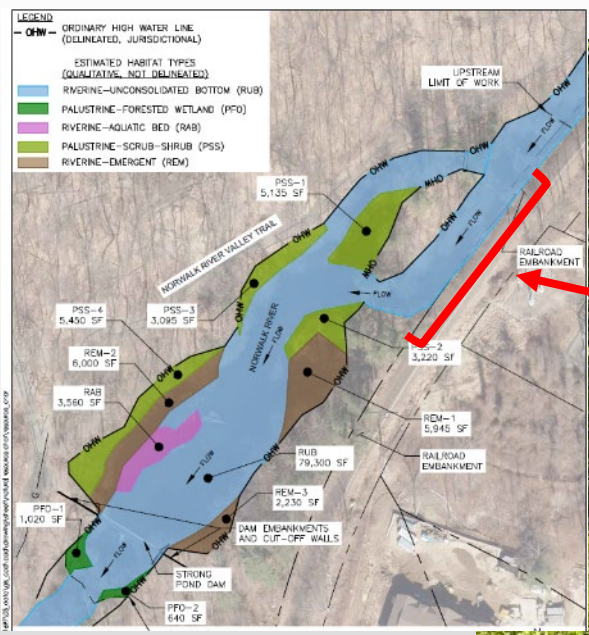
1940s construction

- Excavation of the existing channel to create a wider, deeper “pond” for recreation.
- Placement of fill / boulder retaining walls, disconnecting the natural floodplain.

→ **Needed to reconstruct channel banks, streambed, floodplains**



Dam Removal Design: active v passive restoration?



Adjacent Infrastructure:

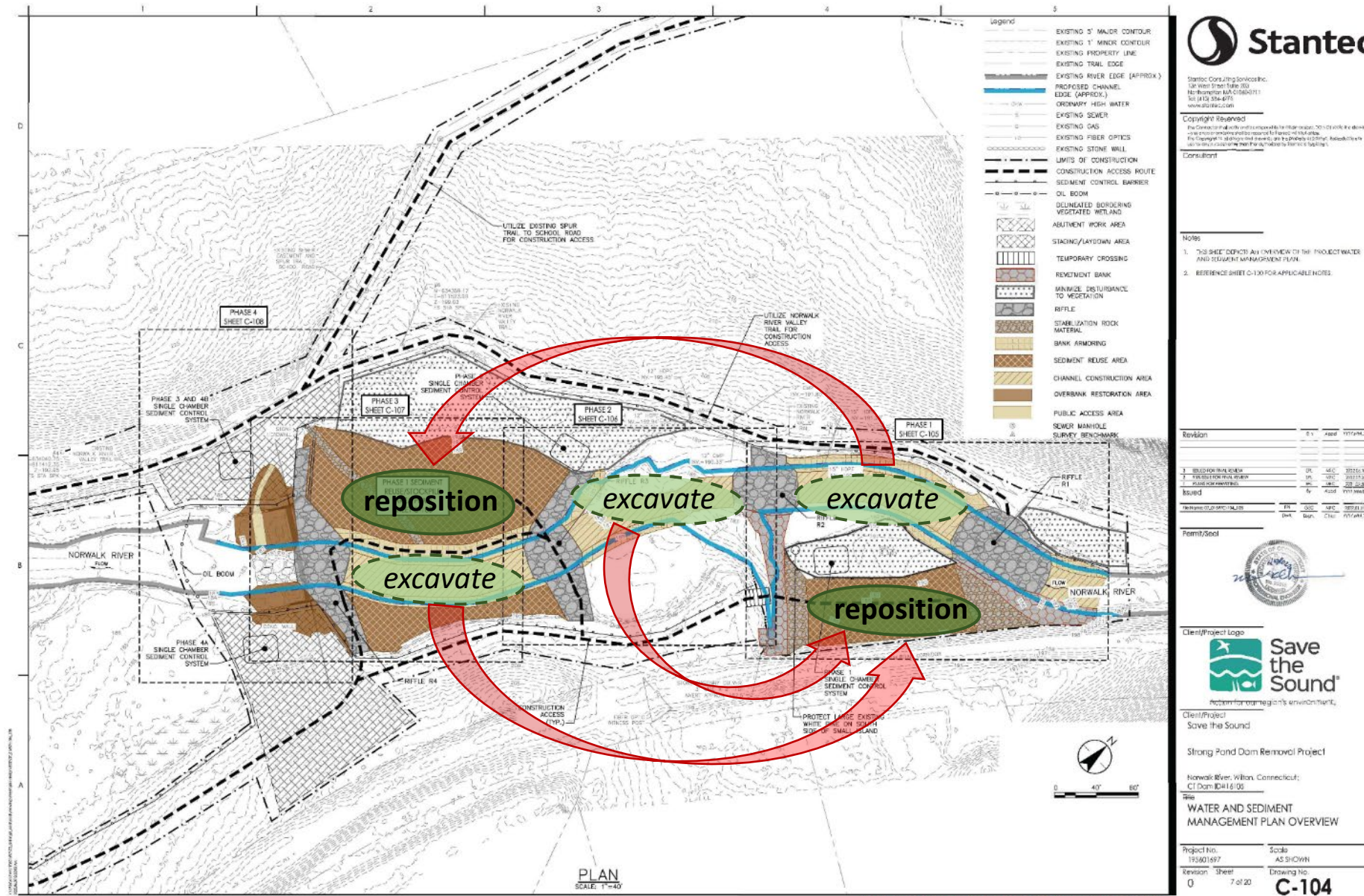
- Cannot endanger RR embankment.
- Natural channel migration NOT acceptable or safe.

→ *Need a stable stream channel, engineered for all possible flows.*

Dam Removal Plan: sediment management

- Alternative 1 - Off-Site Disposal of Sediment
- Alternative 2 - Segregate Sediment with Limited Off-Site Disposal
- **Alternative 3 - On-Site Sediment Management**
- Alternative 4 - Administrative Management Plan and Restricted Access

→ **“Repositioned”** - contained, stabilized, covered with topsoil and native vegetation. About 500 cubic yards.



Dana Dam Removal Design: bank armoring

- Rip-rap type banks for channel stability
- Void space filled with topsoil
- Planted with native seed
- Planted with native shrub “live stakes”
- “habitat boulders” in channel for physical complexity
- Banks left unarmored when possible.

Description of Proposed Channel Bank Types:

Strong Pond Dam Removal plans call for stream channel reconstruction in the former impoundment where excavation removed the natural streambed and banks in 1941, and channel realignment to divert the Norwalk River away from the straightened, armored railroad embankment.

Revetment Bank: necessary for channel realignment, Revetment Banks divert flows away from the Channel Closure Area.

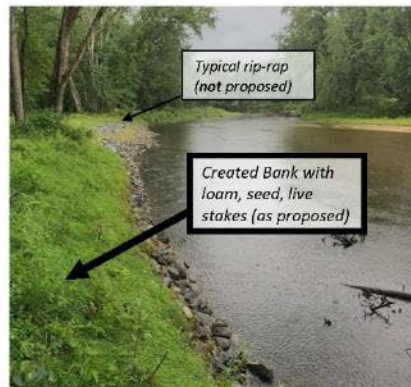
Stabilization Rock Material: a horizontal layer of stone/loam topsoil placed over reused sediments in Channel Closure Area.

Bank Armoring: necessary to reconstruct the channel where “legacy” stream channel and banks were excavated in 1941.



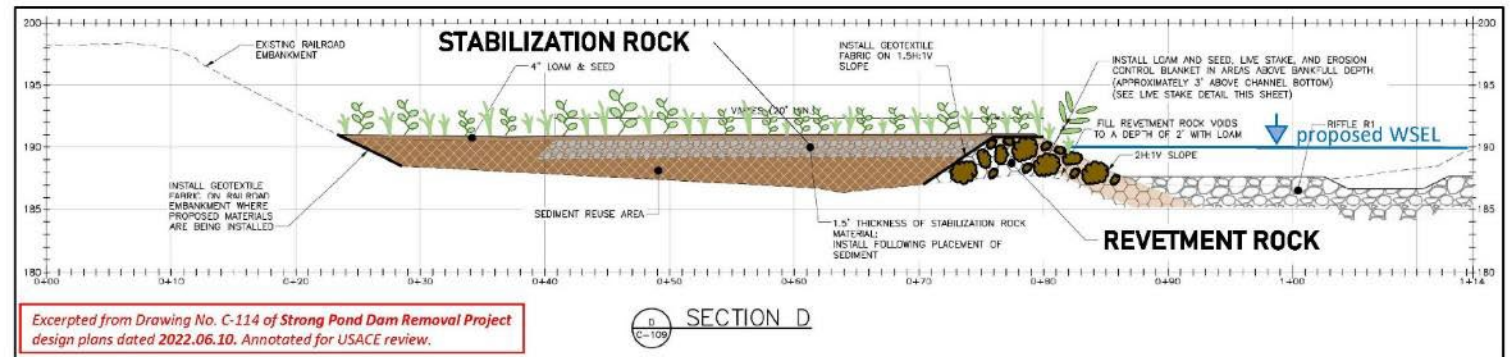
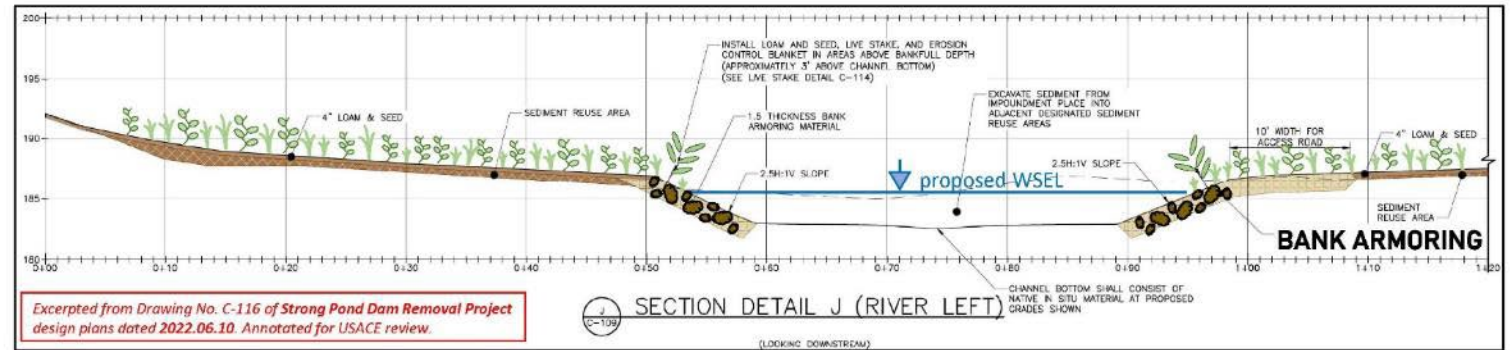
EXAMPLE: Channel Bank Reconstruction at Hyde Pond Dam Removal, Mystic, CT:

A previous dam removal project employing a reconstructed rock bank with loam, native seed, live stakes, and erosion control blanket as specified in Strong Pond Dam Removal design plans. Photos (above) and vegetation monitoring demonstrate successful, native-dominant revegetation established following construction (*Note billboard in background → as reference*). Restored bank appears and functions as a continuous, naturally-vegetated riparian corridor.

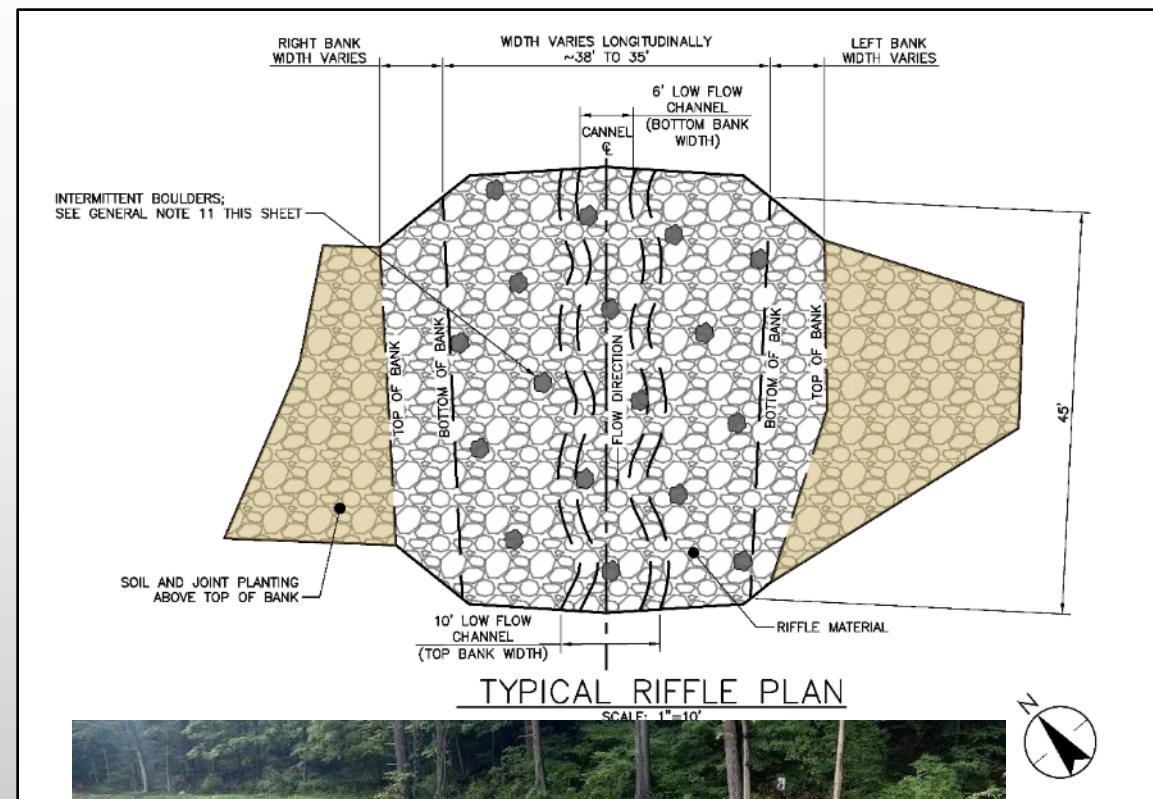
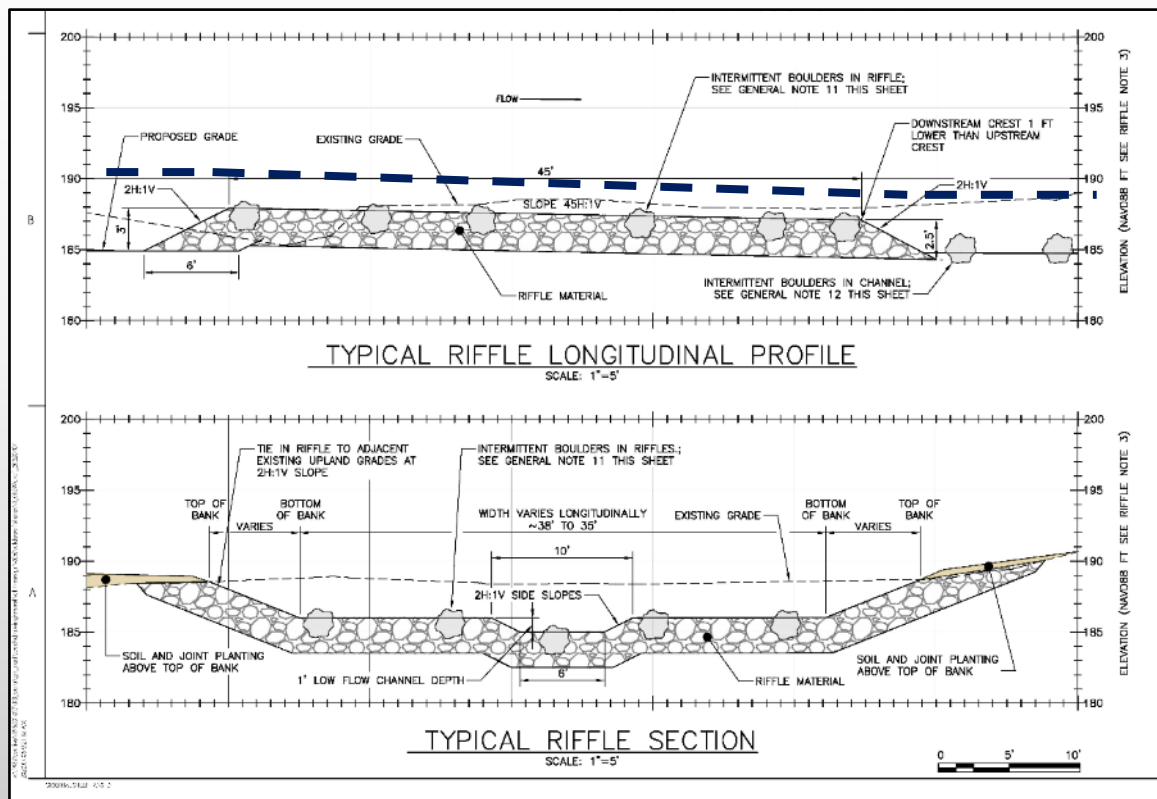


EXAMPLE: Pipeline protection project, Lancaster, NH:

Comparison of typical rip-rap bank treatment, and vegetated bank creation as proposed in Strong Pond Dam Removal design plans. A typical rip-rap bank (photo, rear) was required by site owners for maintenance purposes. The planted bank section (photo, front) is shown after one growing season, fully vegetated.



Dam Removal Design: engineered riffles

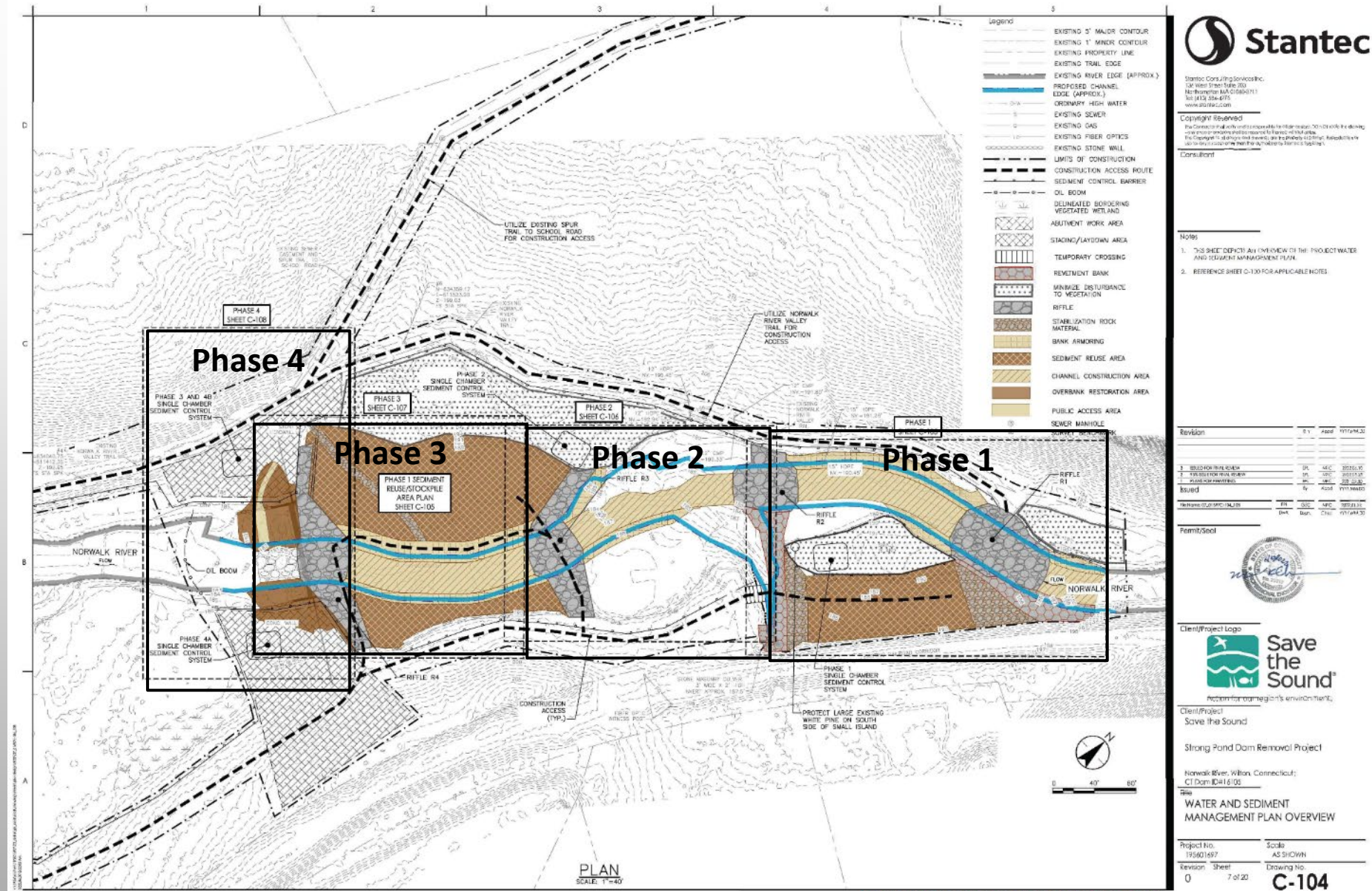


- A large, sloped, rocky “ramp” or “step”
 - Habitat boulders for physical/flow complexity
 - Low-flow channel for passage
 - Looks like a natural rapid or cascade feature
- *not meant to migrate like a natural riffle*

Dam Removal Plan: construction phasing

- **Phases 1:** dewatering the impoundment, excavation of the new channel, repositioning sediment to the floodplain, building banks and riffles.
- **Phase 2:** constructing the Channel Closure Area, diverting flow to the new channel, excavating the channel, building banks and riffles.
- **Phase 3:** excavating the channel, filling the Channel Closure Area, grading the new floodplain areas, building banks and riffles.
- **Phase 4:** demolition and removal of the concrete dam, final grading, building banks and riffles.

Continuous: water management, erosion & sedimentation controls, public access management, rock/soil deliveries....



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100 West Street, 200
Northampton, MA 01060-1111
Tel: 413-536-6175
www.stantec.com

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Consultant



Construction: water management



Construction: excavation / repositioning



Construction: installing rock features



Construction: demolition!



Construction: site restoration



Dam Dana Removal: project timeline

| | 2019 | 2020 | 2021 | 2022 | 2023 |
|----------------------------------|------|------|------|------|------|
| Concept Design/Feasibility | █ | | | | |
| Site Studies and Analysis | | █ | | | |
| 30% design | | █ | █ | | |
| 60% design | | | █ | █ | |
| 100% designs | | | | █ | █ |
| Construction Specs | | | | █ | █ |
| Railroad Review and Permitting | | | █ | █ | █ |
| CT DEEP Permitting | | | | | █ |
| Army Corps Permitting | | | | | █ |
| Site Preparation Activities | | | | | █ |
| Construction | | | | | █ |
| Fundraising and Reporting | █ | █ | █ | █ | █ |
| Stakeholder/Partner Coordination | █ | █ | █ | █ | █ |

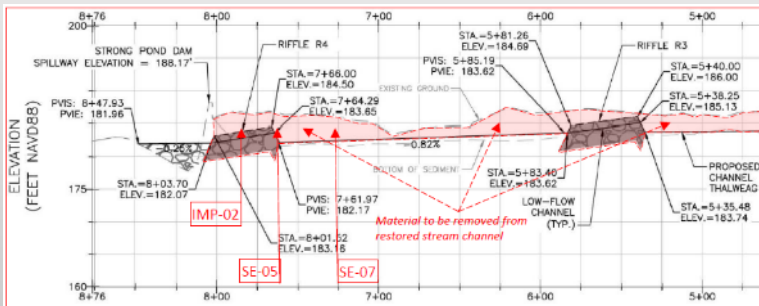


Figure 1: Proposed longitudinal profile excerpted (and annotated) from Drawing No. C-109. Note the "EXISTING GROUND" and "BOTTOM OF SEDIMENT" (depth of refusal/underlying material) relative to PROPOSED CHANNEL THALWEG and RIFFLES.



Figure 4: Results from stable rock sizing material calculations for 500-year storm diameter D_{50} values presented in feet units; proposed rock materials are outline model domain for reference, see Attachment B for details related to proposed.



30% SUBMITTAL FOR REVIEW ONLY
FEBRUARY, 2021



Most popular date: Sat 4/30/16 1:00 PM
Select final option(s)

| | April 2016 | Fr 29 | Sat 30 |
|----------------|------------|-------|--------|
| 3 participants | | | |
| Alice | | | |
| Albert | | | |
| Bob | | | |
| Your name | | | |
| | 0 | 1 | 0 |

"just bumping this up..."

Cannot make it Save



Challenges/Oppportunities: PERMITS!



- **Four (4) separate permits:** CT DEEP Dam Safety, US Army Corps GP10, Metro North “Entry Permit,” municipal E&S
- **Restoration-specific processes:** i.e. vegetated rock banks reviewed as “Stream channel reconstruction, relocation, realignment, and stream bed modification“ under USACE General Permit 10. AQUATIC HABITAT RESTORATION, ESTABLISHMENT & ENHANCEMENT ACTIVITIES.
- **Communicating with your regulators...** Each permit is a multi-layered review process. Find out what info is important for your project and how best to communicate it. *This is a collaboration with subject experts.*

Connecticut
Department of Energy & Environmental Protection
portal.ct.gov/DEEP

Save the Sound
900 Chapel Street, Suite 2202
New Haven, CT 06510

Attn: Alex Krofta, akrofta@savethesound.org

Application No.: DS-202108644
Town: Wilton
Waters: Norwalk River
Permit type: Dam Safety
Project: Removal of Stron

Dear Mr. Krofta:

The Commissioner of the Department of Energy & Environmental Protection is pleased to announce that you have been granted a permit to conduct certain regulated activities. You should read your permit carefully. Please pay particular attention to items 1 through 3.

If you have not already done so, you should contact the Connecticut Department of Transportation, Office of Dam Safety, 100 Capitol Mall, Hartford, CT 06106-5127, or the US Army Corps of Engineers, New England District, Regulatory Permit Branch, 238 Danbury Road, Wilton, CT 06897, for more information. Please do not file the permit on the metro-north commuter railroad company website.

If you have any questions concerning your permit, please contact Alex Krofta at akrofta@savethesound.org.

February 27, 2023
DATE

79 Elm Street
Hartford, CT 06106-5127
860.424.3000

DB-23-1 MF 7.32
PERMIT NH-CT-ALL

METRO-NORTH COMMUTER RAILROAD COMPANY

PERMIT TO ENTER UPON PROPERTY

PERMISSION is hereby granted to **SAVE THE SOUND, INC.**, (hereinafter called "Permittee") to enter property of the State of Connecticut, under the authority of the Connecticut Department of Transportation, Office of Dam Safety, managed by Metro-North Railroad, a subsidiary of the Metropolitan Transportation Authority (hereinafter called "Railroad") to enter property of the State of Connecticut for the purpose of the removal of the Strong Pond Dam and spillway excavation within the former 1.5-acre impoundment of the Norwalk River. This permit shall be sold below and under the terms and conditions set forth herein.

1. LOCATION AND ACCESS: The permittee shall have access to the property at the location of the dam and spillway excavation within the former 1.5-acre impoundment of the Norwalk River, in the Town of Wilton, Connecticut.

2. LIABILITY: The permittee shall be responsible for all tasks and associated costs and shall indemnify, defend, and hold the State of Connecticut, its agencies, officers, employees, agents, or invitees, harmless from and against any and all claims, damages, losses, costs, and expenses, including reasonable attorneys' fees, that may be asserted against or incurred by the State of Connecticut, its agencies, officers, employees, agents, or invitees, arising out of or from the occupancy or use of the property by the permittee, its contractors, agents, or invitees, sustained by any or all persons (including corporations who may be liable therefor).

3. CONSIDERATION: The permittee shall pay to the Railroad the non-refundable fee of \$10,000.00 for this permit, and the fee shall be paid to the Railroad by the permittee or its agents, in full, at the time of application; WAIVED of this Permit; and the permittee shall execute and deliver to the Railroad a copy of this permit, which is the Railroad's property, and the Railroad shall be responsible for the return of the permit to the Railroad at the time of completion of the project as enumerated in paragraph 1.

Regulatory Division
File Number: NAE-2021-01935

Save the Sound
c/o Alex Krofta
900 Chapel Street, Suite 2202
New Haven, Connecticut 06510
Sent by email: akrofta@savethesound.org

Dear Mr. Krofta:

The U.S. Army Corps of Engineers (USACE) has reviewed your application for a General Permit (GP) for the removal of a dam and spillway excavation within the former 1.5-acre impoundment of the Norwalk River, in the Town of Wilton, Connecticut. The USACE has issued a General Permit (GP) for the removal of a dam and spillway excavation within the former 1.5-acre impoundment of the Norwalk River, in the Town of Wilton, Connecticut. The GP is known as the Connecticut General Permits (GPs). The GPs are also available on the USACE website at www.nae.usace.army.mil/Missions/Regulatory/State-General-Permits/Connecticut-General-Permit.

Please review the enclosed GPs carefully, in particular its general conditions beginning on page 48, and ensure that you and all personnel performing work authorized by the GPs are fully aware of and comply with its terms and conditions. A copy of the GPs and this verification letter shall be available at the work site by General Condition 28. You must perform this work in compliance with the special conditions:

Special Condition 1: Any sediment producing work (excavation and grading) by the permittee shall be conducted in "dry" condition by limiting work to periods of low flow, by confining and lowering the water level within the reservoir using appropriate management techniques; or confining work areas with temporary coffer dams, and installing turbidity curtains. The purpose of this condition is to minimize the likelihood of sediment impact and water quality exceedances from excavation and grading outside of the disturbance.

PLANNING & ZONING COMMISSION
Telephone: (203) 563-0185
Fax: (203) 563-0284

TOWN OF WILTON
TOWN HALL ANNEX
238 Danbury Road
Wilton, Connecticut 06897

SEDIMENTATION AND EROSION CONTROL APPROVAL

DATE: 1/13/2023

PROPERTY LOCATION: 45 LOVERS LA

PROJECT: Dam removal and 2 staging areas along Norwalk River

APPLICANT: Alex Krofta with Save the Sound/WILTON TOWN OF

ADDRESS: 238 DANBURY RD WILTON, CT 06897

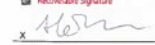
PHONE: 203-787-8646 ex113

CONDITIONS OF APPROVAL


- Notification shall be given to Town's Planning and Zoning Office (563-0187) when work will begin. All disturbed areas are to be controlled and stabilized at all times.
- The Planning and Zoning Department shall be kept up to date on the progress of the work, if necessary the Town's Agent can request additional measures during construction (ie: silt fence or haybales).
- Failure to comply with the conditions of this approval may invalidate your permit and cause the issuance of a STOP WORK ORDER.

Install silt fence prior to grading.

Recoverable Signature

X 

Alex Krofta
Project Manager, Save the Sound
Signed by 016893e-1871-4623-9e69-07108692a2d



AGENT

Challenges/Opportunities: Railroad!

- **Timelines:** could have easily been a no-go (insert train-related metaphor)
- **Requirements:** additional complicated insurance, force account (\$) for flaggers
- **Communication:** talking to the range of people involved with different aspects of review and oversight (Engineering, Property, Operations, others)



Challenges/Opportunities: Construction!

- **“Hybrid” Oversight:** project engineer and Save the Sound shared oversight duties – this led to complications
- **Expert Contractor:** extensive dam removal experience
- **Construction contract management “specialist” on the team:** this is a complicated task with lots of details... try it at your own risk
- **Standing Meetings:** with project team, stakeholders, funders, regulators.... when done well, this eliminates surprises and helps roll with contingencies



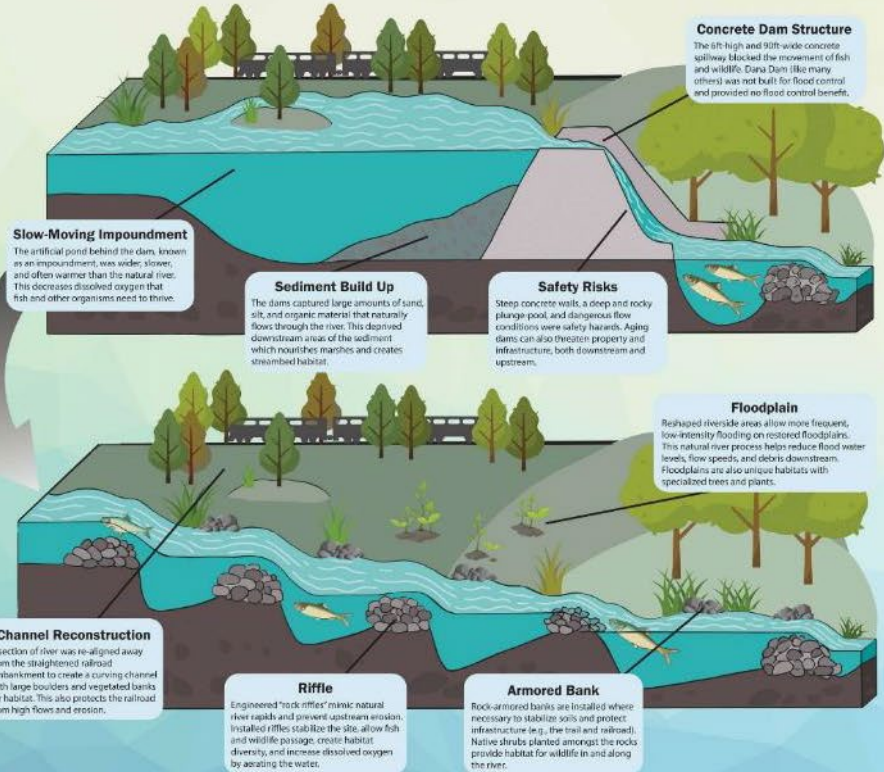
Challenges/Opportunities: Town Park!

- **Liability:** highly sensitive to legal/financial/public-perception liability
- **VERY Public:** hundreds of users daily on the NRVT, safety and aesthetics are critical
- **Memorandum of Agreement:** critical tool for navigating the relationship between site owner, project manager, engineer, contractor
- **Resources and Expertise:** Town staff, equipment, facilities
- **VERY public:** immense opportunity to educate/engage



VERY public:
immense opportunity to educate/engage

How Has Removing Dana Dam Restored the Norwalk River?



Historical dams leave a legacy of environmental harm.

For 80 years Dana Dam, or Strong Pond Dam, was located here on the Norwalk River. Charles Dana built the dam in the early 1940s to create an ice-skating and swimming pond which was enjoyed by the local youth and their families. At only about six feet tall, the dam had an ecological impact disproportionate to its size. It slowed water flow, increased water temperatures, submerged the natural floodplain of the river, and acted as a barrier to fish and other wildlife. As other dams on the Norwalk River were removed, Dana Dam became the first barrier upstream of Long Island Sound to migratory fish such as alewife, blueback herring, and sea lamprey in their search for suitable habitat to lay eggs and replenish their populations.

Dana Dam was removed to restore river function.

At the turn of the 21st century, local restoration and conservation organizations began advocating for the removal of the dam. Between 2018 and 2023, project partners led by Save the Sound came together to remove the structure. Accumulated sediment was excavated, the upstream channel was realigned away from the railroad embankment, the banks were stabilized with rock, engineered riffles were installed, and—at last—the dam was removed. To learn more about the history and future of this project, visit www.savethesound.org.

The removal reconnected critical miles of upstream habitat on the Norwalk River.

Removing dams contributes to the riverine functions that support multiple species and ecosystems. The removal of Dana Dam converted what was once stagnant water in the former impoundment back into a free-flowing river that transports sediments downstream, contributing to streambed habitat and sustaining critical coastal marshes. Fish and wildlife not only have a healthier river habitat but can also access upstream breeding and feeding grounds in the Norwalk River which they relied on before the dams were built.

Removing Dana Dam and surrounding habitat increased the community's resilience to storms and flooding.

As storms increase in both frequency and intensity, aging dams are at increased risk of failing, and may also exacerbate flooding. Dam removals decrease the liability for the dam owner associated with public safety, dam failure, flood risk, or damage to essential infrastructure downstream or adjacent to the river such as the railroad along the Norwalk River here. The removal of the dam makes the Norwalk River safer for recreational activities and more resilient in the face of climate change.

How will this site change over time?

When a dam is removed, the exposed soil quickly rebounds with vegetation. The restored floodplains will repopulate with native plants growing from native plantings and the previously submerged seed bank. Over time, the Dana Dam site will transform into a diverse habitat of native trees, grasses, and other flowering plants along a stable, flowing stream.



River restoration doesn't stop here.

Dana Dam was one of over 5,000 that persist around Long Island Sound in Connecticut and New York that block fish passage and weaken the natural functions of our watersheds. Many of these dams are old and falling apart without proper maintenance, leaving communities with deteriorating structures that no longer serve a purpose and present safety and ecological hazards. You can join the movement to remove these unnecessary dams and restore our rivers by advocating for dam removals and nature-based solutions in your community.



How Will the Removal of Dana Dam Help Fish?

No matter where you stand, you are in a watershed.

A watershed is the land area that drains to a particular river, lake, or other water body. In New England, it's very likely that you are standing within the watershed of multiple water bodies, a large one such as Long Island Sound, a large river such as the Norwalk, and maybe a smaller tributary like Comstock Brook.

The Norwalk River Watershed spans 62,000 acres and seven towns – Norwalk, Wilton, New Canaan, Weston, Lewisboro, Ridgefield, and Redding. Major tributaries include the Silvermine and Comstock Brook, and the Norwalk River is a major tributary to Long Island Sound, providing the estuary at Norwalk Harbor. Because river ecosystems are interconnected, dam removal has benefits throughout the watershed.

Fish populations can recover in restored river ecosystems.

With Dana Dam removed, fish can now migrate a little way upstream to the dams in Georgetown, CT. These additional miles of habitat in the Norwalk River and its tributaries make a world of difference, especially for diadromous fish. **Diadromous fish** must migrate from salt water to freshwater (and vice versa) to reproduce, making the connection to Long Island Sound essential. And these fish are a part of the larger Long Island Sound food chain, which includes all types of wildlife, even as humans!

River restoration doesn't stop here.

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You are here Wilton

River Herring
Alewife and blueback herring are long-traveling silver fish that once filled our region's rivers each spring as they migrated upstream to spawn. Their abundant populations fed local ground squirrels, chipmunks, and both freshwater and saltwater wildlife. They have since been decimated by habitat fragmentation (including dam construction, water quality degradation, and overfishing).

Sea Lamprey
In the ocean, when the lamprey feed as parasites on larger fish, spawning adults stop feeding altogether; all their energy is used to swim upstream, excavate circular rock nests, and reproduce before dying. Other species may then utilize these highly eroded rock nests called "nests".

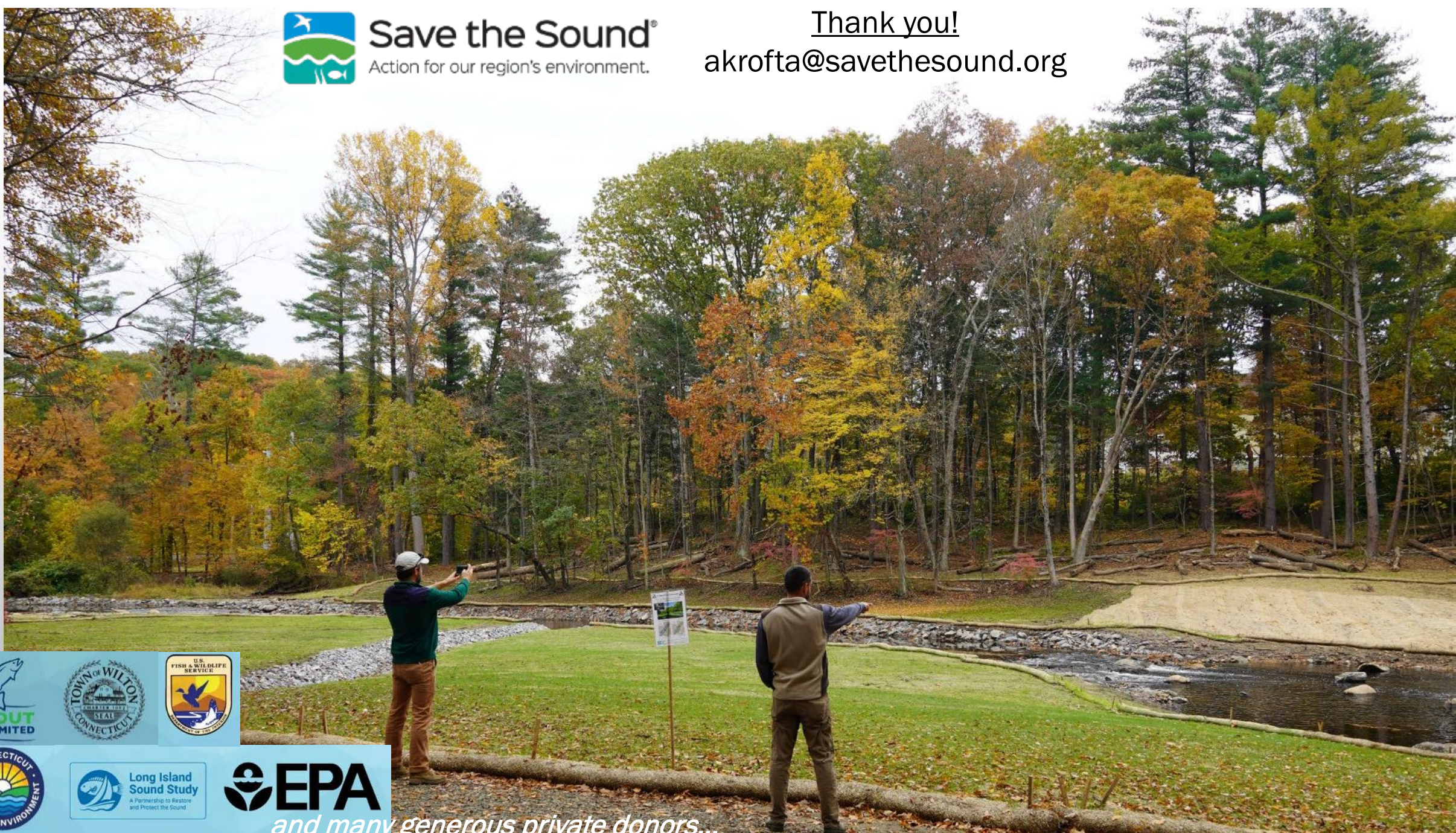
American Eel
American eels are a common river resident with a fascinating life cycle. Instead of migrating into streams to spawn like most freshwater fish, they lay their adults in freshwater before returning to the ocean to spawn. Their tiny larvae swim back up into rivers to begin the cycle again.

Trout
Native brook trout and stocked rainbow and brown trout are prized by anglers. While most trout spend their life cycle in rivers, some special "sea-run" individuals venture into saltwater to feed. Stream or estuarine trout need to move freely within rivers to find food, cool water, and shade.



Save the Sound®
Action for our region's environment.

Thank you!
akrofta@savethesound.org



and many generous private donors...

Dana Dam Removal Design: wetlands

Aquatic Resources:

Removal of a dam inherently changes the existing aquatic resources on a site. For the proposed Strong Pond Dam Removal, a proactive restoration project, the aquatic resource impacts (primarily, loss of an unnatural open-water impoundment) are offset by benefits to the site (restored pool-riffle channel, floodplain connectivity) and benefits to the Norwalk River watershed ecosystem (upstream diadromous fish passage, natural fluvial processes/sediment dynamics).

Jurisdictional aquatic resource areas at the project site are delineated below the Ordinary High Water Mark (OHW) as described and depicted in the *Federal and State Wetland Delineation, Strong Pond Dam Removal* memo (Stantec, July 1, 2021). Indirect and Fill Impacts are described and quantified in the APPLICATION IMPACT SUMMARY table below.

Existing and proposed habitat types (estimated) within the aquatic resource areas are described in the Wetlands Functions and Value Assessment (Stantec, January 12, 2022) and maps/table attached here.

| APPLICATION IMPACT SUMMARY | | | | | | | |
|--|------------------|---|---------------------|------------------|---------------------------------------|---------------------|---|
| DIRECT PROJECT IMPACTS FROM FILL ¹ | | | | | | | |
| Wetland/Feature ID | PERMANENT FILL | | | TEMPORARY FILL | | | INDIRECT IMPACT TO AQUATIC RESOURCES ² |
| | Area Filled (SF) | Purpose of Fill and Type of Fill | Amount of Fill (CY) | Area Filled (SF) | Purpose of Fill and Type of Fill | Amount of Fill (CY) | |
| Strong Pond Dam | 18,899 | Constructed grade-control riffle (boulder rock) | 1,750 | 247 | Water Handling coffer dams (sand bag) | 46 | 69,172 (dewatering, realignment, excavation) ³ |
| Removal project site: i.e. all areas waterward of the delineated OHW line ³ | 3,236 | Sediment Reuse Area stabilization (rock cobble) | 180 | | | | |
| | 13,478 | Reconstructed channel bank (boulder rock) | 998 | | | | |
| | 2,719 | Channel realignment revetment (boulder rock) | 453 | | | | |
| | 7,844 | Floodplain restoration planting area (top soil) | 145 | | | | |
| TOTALS | 46,176 | | 3,526 | 247 | | 46 | 69,172 |
| Total Resource Area Impacts (SF): | | | | | | | 115,595 |
| Total New/Converted Resource Areas ⁴ (SF): | | | | | | | 72,840 |
| Permanent Resource Area Impact/Loss (SF): | | | | | | | 42,755 |

¹ Federal jurisdictional boundary in inland waters is the ordinary high-water mark extended to include any adjacent wetland.
² Indirect and secondary impacts including areas drained, graded or altered that do not include the discharge of permanent or temporary fill below OHW.
³ Label your wetland area impacts so that they correlate with the labeling on the project plan and federal wetland delineation datasets/environmental report.
⁴ New/Converted Resource Areas include reconstructed channel and all additional aquatic resource areas below estimated OHW under proposed post-removal conditions.
⁵ Post-removal site restoration activities (non-fill) include permanent impoundment dewatering, excavation and repositioning/grading of sediment, and channel realignment.

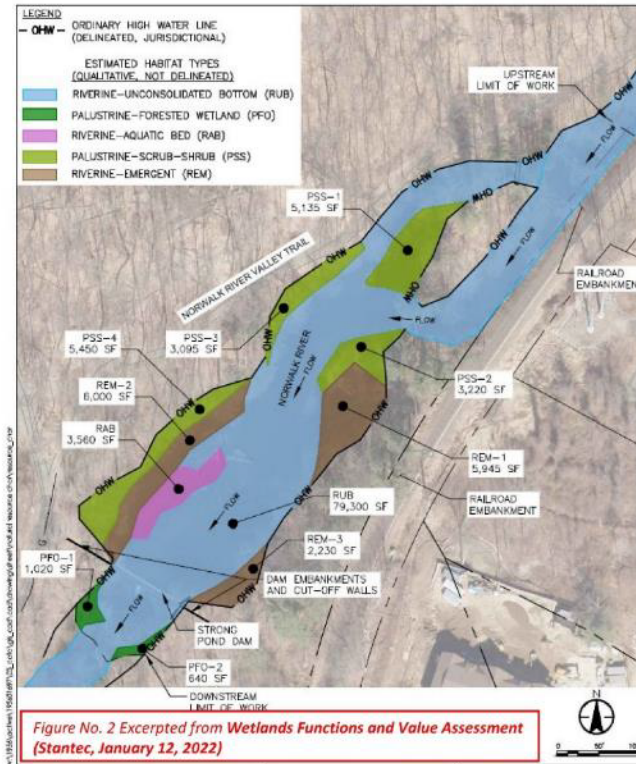


Figure No. 2 Excerpted from Wetlands Functions and Value Assessment (Stantec, January 12, 2022)

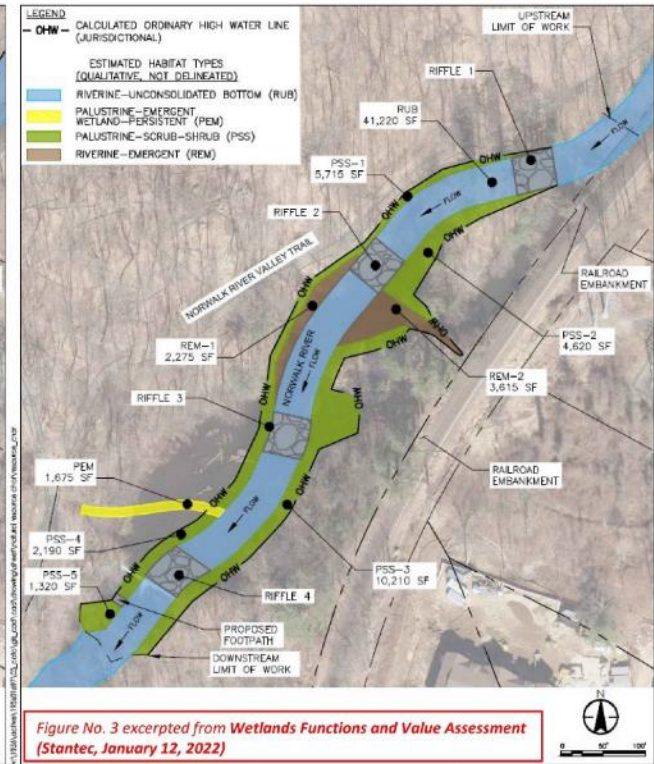


Figure No. 3 excerpted from Wetlands Functions and Value Assessment (Stantec, January 12, 2022)

Estimated Habitat Types:

Existing and proposed habitat types were estimated according to *Classification of Wetlands and Deep-water Habitats of the US* (Cowardin, 1979). These classifications are qualitative (non-jurisdictional), based on aerial photos and on-site observations.

Proposed conditions include a diversity of aquatic resource habitat types and restored upstream connectivity. Dewatering of the unnatural, over-widened impoundment (RUB) accounts for 38,080 SF of impacts, or nearly 90% of permanent impacts. Newly-created RUB habitat will consist of a more complex restored pool-riffle channel, riverine emergent (REM) habitat will decrease in extent but persist, scrub-shrub (PSS) will increase in extent, and palustrine emergent (PEM) will be established.

Table 1 excerpted from Wetlands Functions and Value Assessment (Stantec, January 12, 2022)

| Existing Wetland Classification Areas | EXISTING WETLAND CLASSIFICATION AREAS | | | | | | | | | | | | |
|---------------------------------------|---------------------------------------|---------------|-----|---------------|-----|--------------|-----|--------------|-------|---------------|-----|-----------|-----------------|
| | RUB | | REM | | RAB | | PFO | | PSS | | PEM | | Total Area (SF) |
| | ID | Area (SF) | ID | Area (SF) | ID | Area (SF) | ID | Area (SF) | ID | Area (SF) | ID | Area (SF) | |
| | 1 | 79,300 | 1 | 5,945 | 1 | 3,560 | 1 | 1,666 | 1 | 5,135 | - | - | |
| | 2 | 6,000 | - | - | 2 | 640 | 2 | 5,220 | - | - | - | - | |
| | 3 | 2,230 | - | - | - | - | - | 3 | 3,026 | - | - | - | |
| | 4 | 5,450 | - | - | - | - | - | 4 | 5,450 | - | - | - | |
| Totals (SF) | | 79,300 | | 14,175 | | 3,560 | | 1,666 | | 16,900 | | - | 115,595 |
| % of Total | | 68% | | 12% | | 3% | | 1% | | 15% | | 0% | 100% |

| Proposed Wetland Classification Areas | PROPOSED WETLAND CLASSIFICATION AREAS | | | | | | | | | | | | |
|---------------------------------------|---------------------------------------|---------------|-----|--------------|-----|-----------|-----|-----------|--------|---------------|-----|--------------|-----------------|
| | RUB | | REM | | RAB | | PFO | | PSS | | PEM | | Total Area (SF) |
| | ID | Area (SF) | ID | Area (SF) | ID | Area (SF) | ID | Area (SF) | ID | Area (SF) | ID | Area (SF) | |
| | 1 | 41,220 | 1 | 2,275 | - | - | - | - | 1 | 5,715 | 1 | 1,675 | |
| | 2 | 9,815 | - | - | - | - | - | 2 | 4,620 | - | - | | |
| | 3 | 10,210 | - | - | - | - | - | 3 | 10,210 | - | - | | |
| | 4 | 2,190 | - | - | - | - | - | 4 | 2,190 | - | - | | |
| | 5 | 1,320 | - | - | - | - | - | 5 | 1,320 | - | - | | |
| Totals (SF) | | 41,220 | | 5,890 | | - | | - | | 24,955 | | 1,675 | 72,840 |
| % of Total | | 57% | | 8% | | 0% | | 0% | | 32% | | 2% | 100% |

| NET CHANGES (Estimated - Existing) | | | | | | | |
|------------------------------------|---------|--------|--------|--------|-------|-------|-------------------|
| | RUB | REM | RAB | PFO | PSS | PEM | Total Change (SF) |
| Net Changes | RUB | REM | RAB | PFO | PSS | PEM | Total Change (SF) |
| Change (SF) | -38,080 | -4,285 | -3,500 | -1,666 | 7,185 | 1,675 | -42,755 |