Getting Migratory Fish Over the Myriad of Barriers in Connecticut

GOING WITH THE FLOW

The Soil & Water Conservation Society (SWCS)
Southern New England Chapter (SNEC)
2019 Annual Winter Conference

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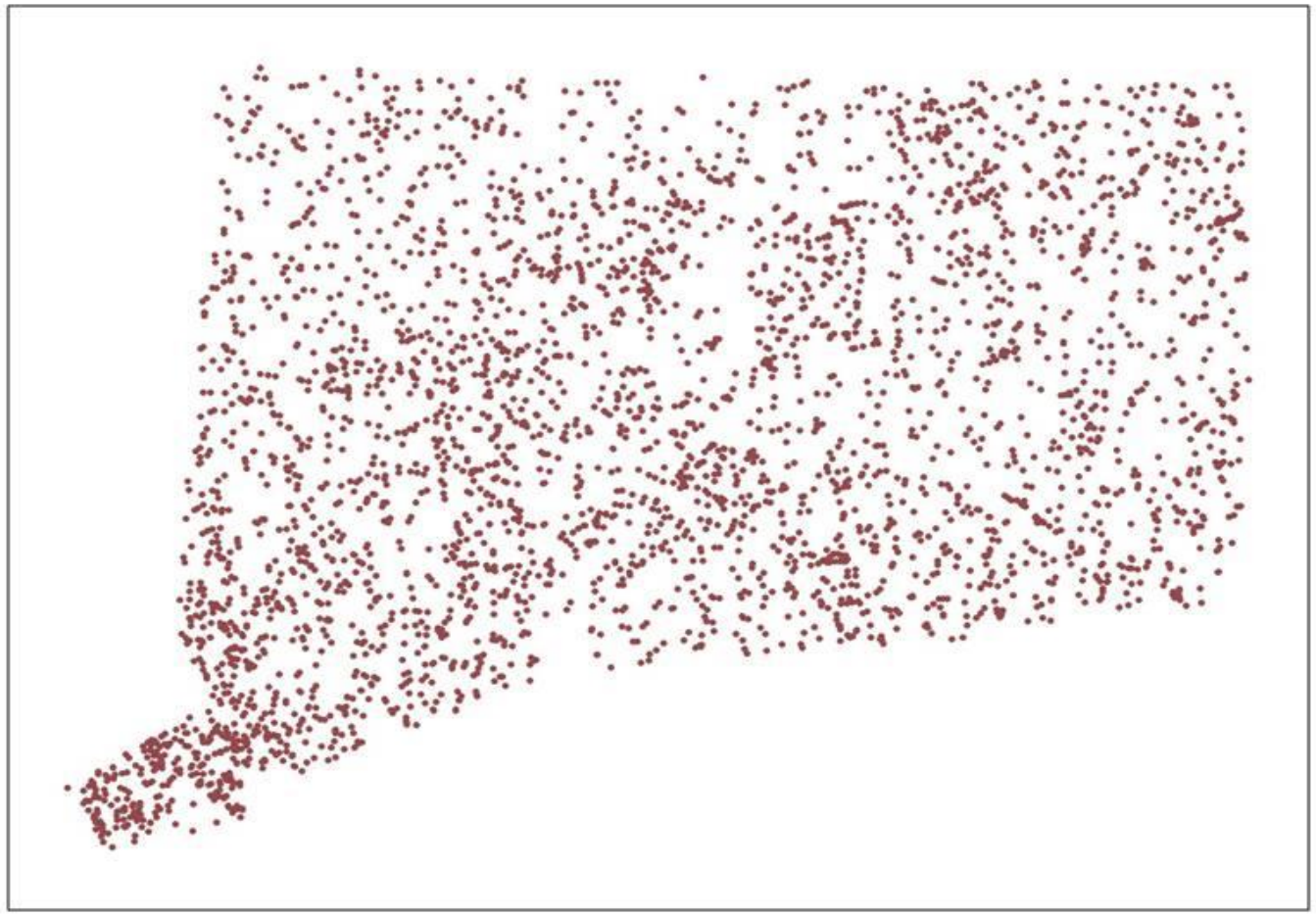
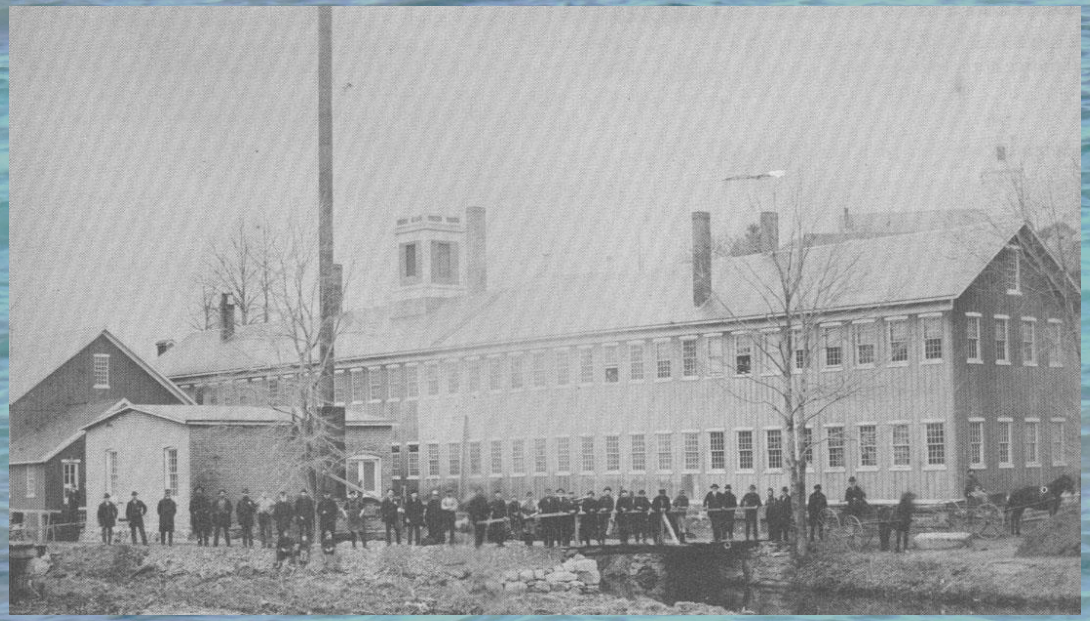
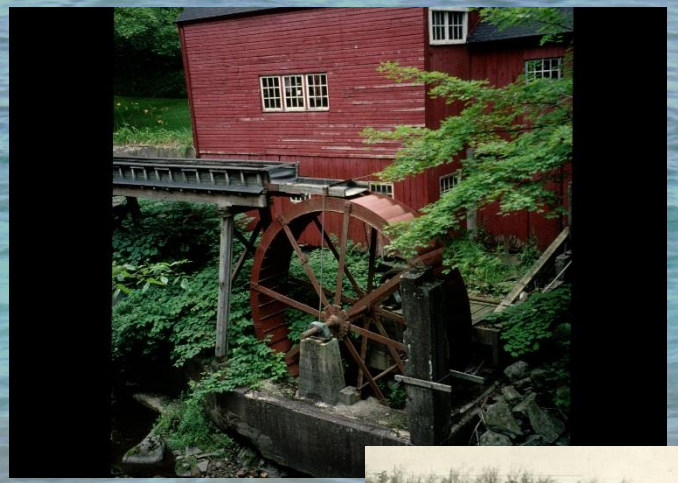
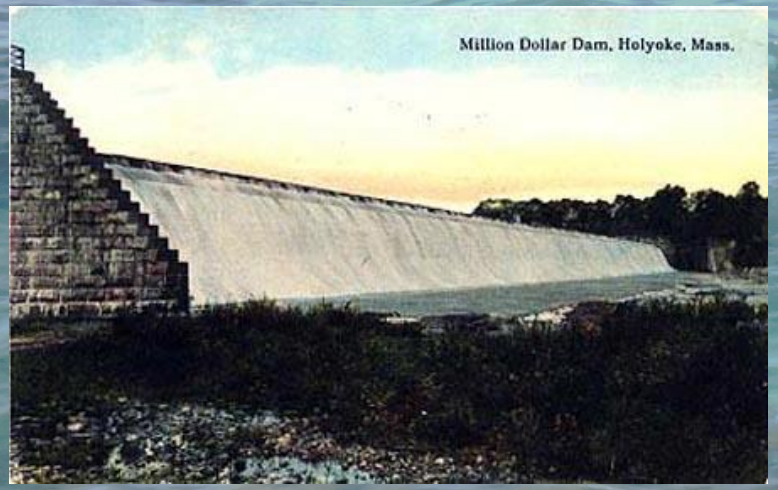
Connecticut Department of
ENERGY & ENVIRONMENTAL PROTECTION

DAMS IN CONNECTICUT








Million Dollar Dam, Holyoke, Mass.

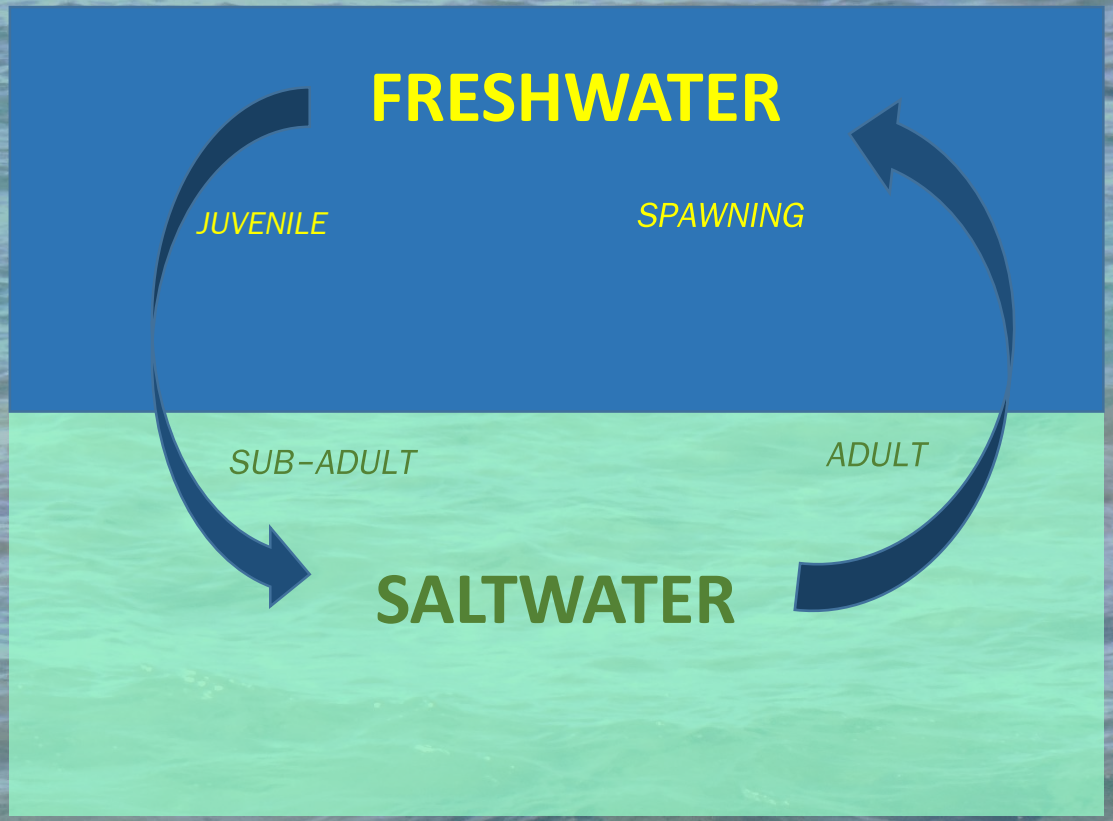
Problems with dams:

- If they fail, loss of life and property downstream
- People can fall off, go over, or drown in pond
- Aggravate upstream flooding
- Personal liability
- Regulatory obligation to maintain- costly
- Alters native instream habitat
- Raise water temperature
- Reduces dissolved oxygen
- Traps sediment
- May alter flow patterns of stream below dam
- Blocks the movement of aquatic species such as fish

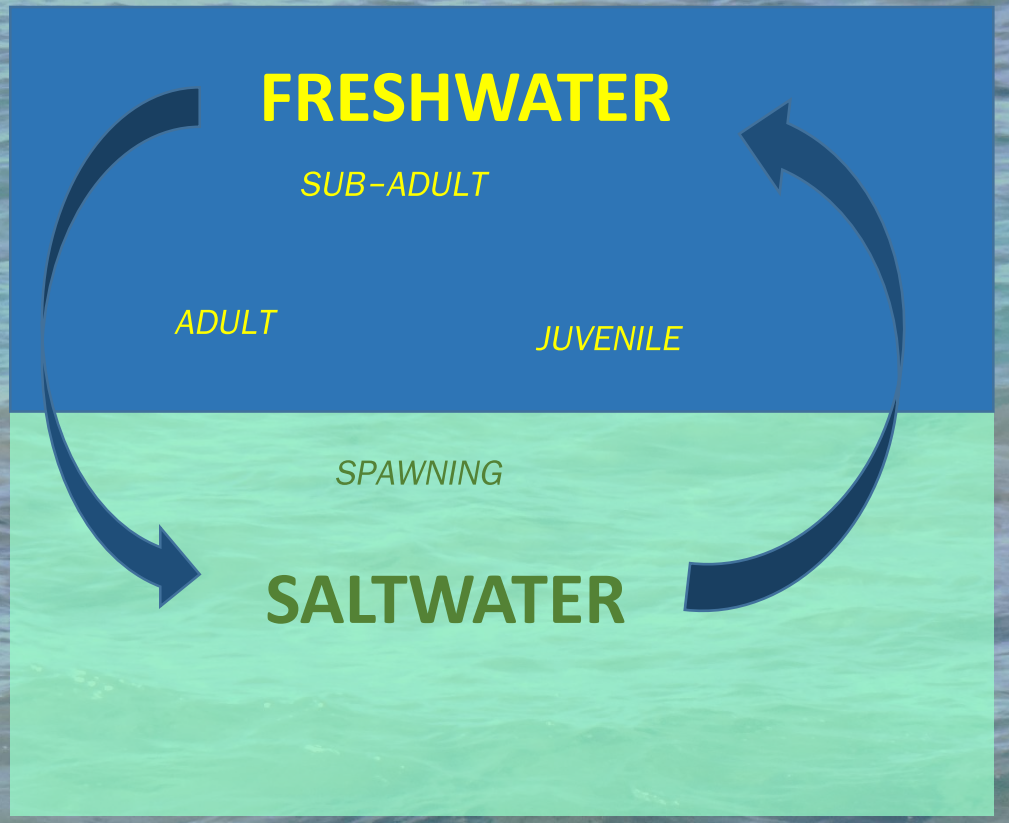
ANADROMOUS


R Jacobs

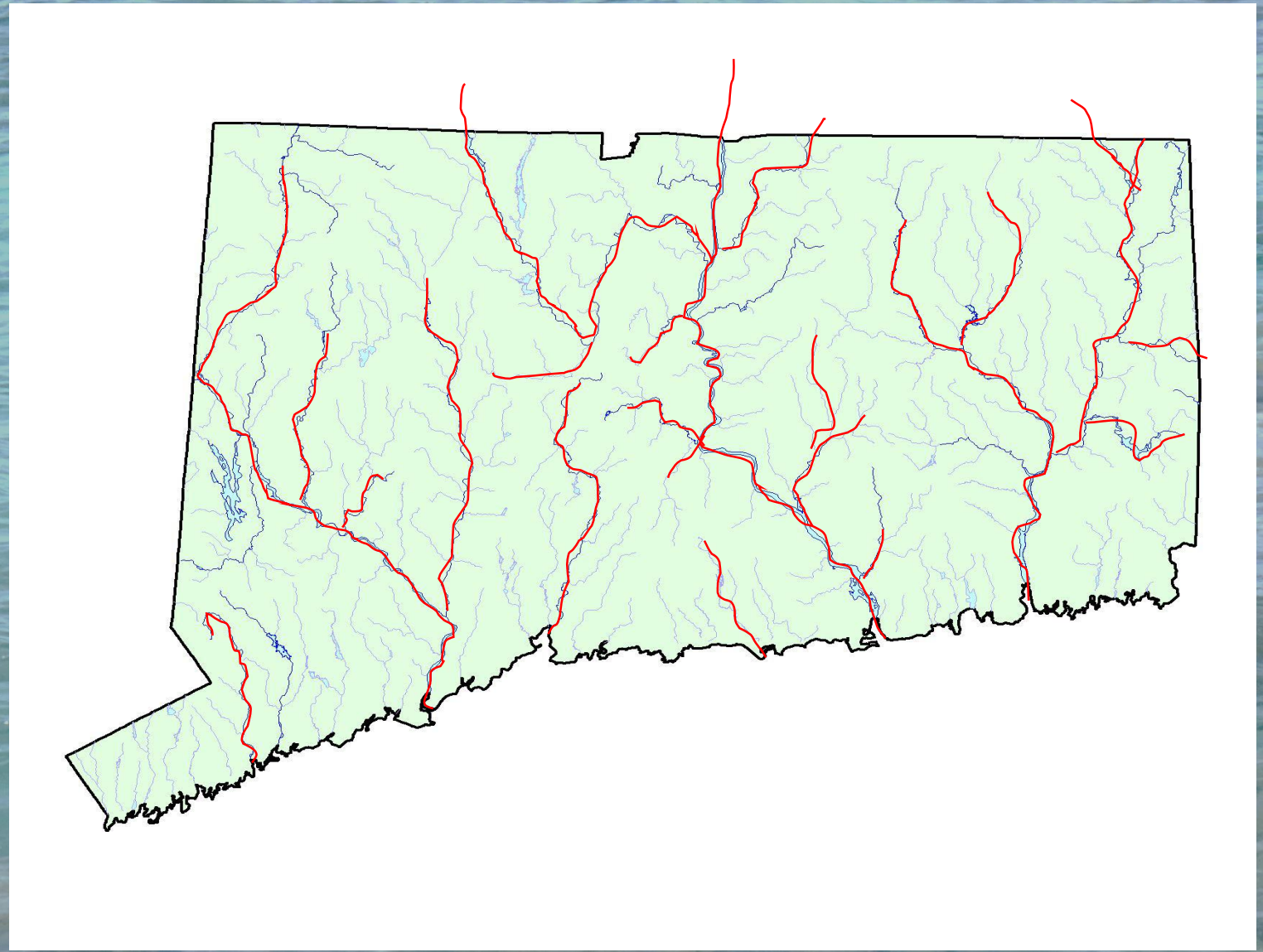

R Jacobs


FRESHWATER
JUVENILE
SPAWNING
SUB-ADULT
ADULT
SALTWATER

CATADROMOUS



Migratory fish– “diadromous”




R Jacobs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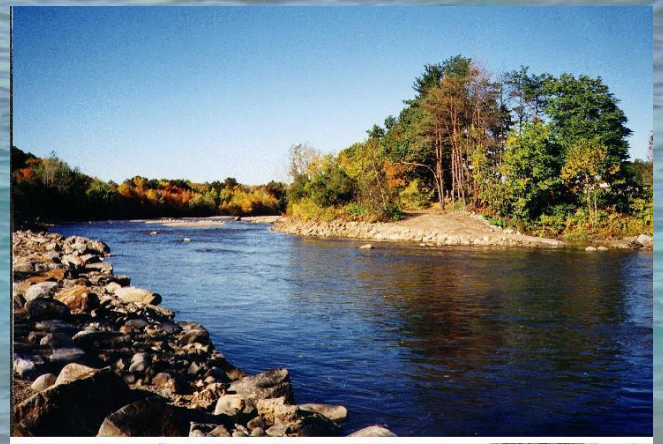
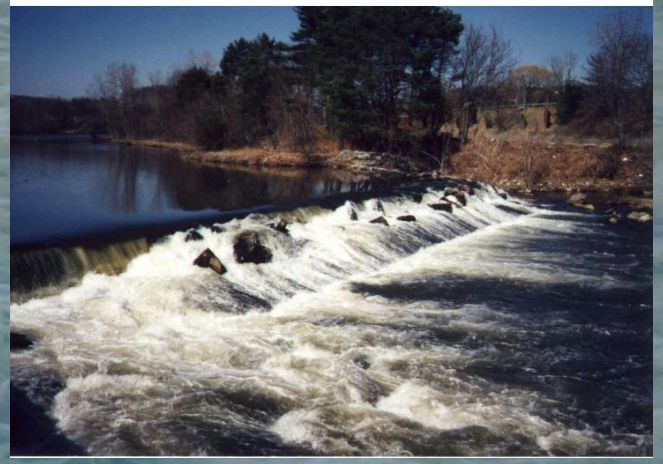
SOLUTIONS

DAM REMOVAL





- RESTORES FISH PASSAGE
- ELIMINATES ARTIFICIAL IMPOUNDMENT, THUS RESTORING NATURAL HABITAT
- REDUCES WARMING OF WATER
- RESTORES NATURAL FLOW OF SEDIMENT
- REDUCES RISK OF FLOODING
- ELIMINATES PUBLIC SAFETY THREAT
- ELIMINATES NEED TO MAINTAIN A STRUCTURE

SOLUTIONS

CONSTRUCT A FISHWAY

- RESTORES FISH PASSAGE
- MAINTAINS THE VALUE OF THE DAM, IF IT HAS ONE
- OFFERS A PORTAL FOR VIEWING A WILD FISH RUN

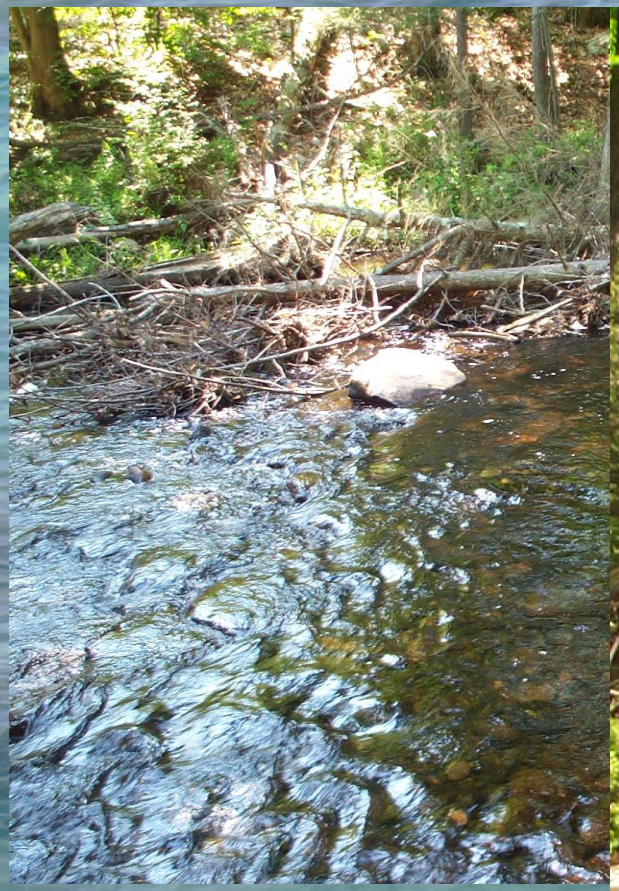
SOLUTIONS

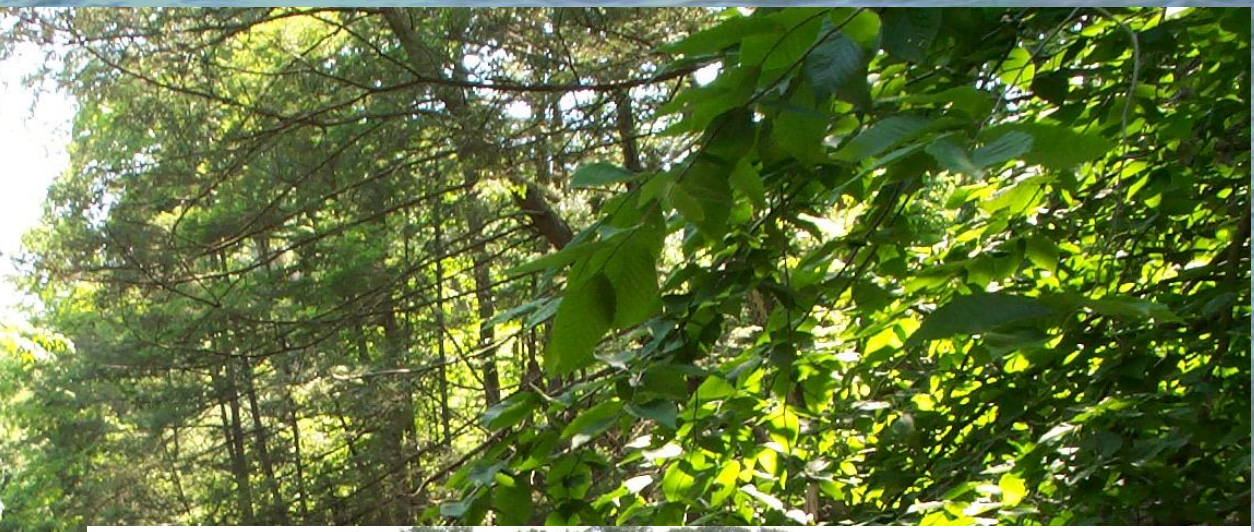
CONSTRUCT AN EEL PASS

- RESTORES FISH PASSAGE
- MAINTAINS THE VALUE OF THE DAM, IF IT HAS ONE
- OFFERS A PORTAL FOR VIEWING A WILD FISH RUN

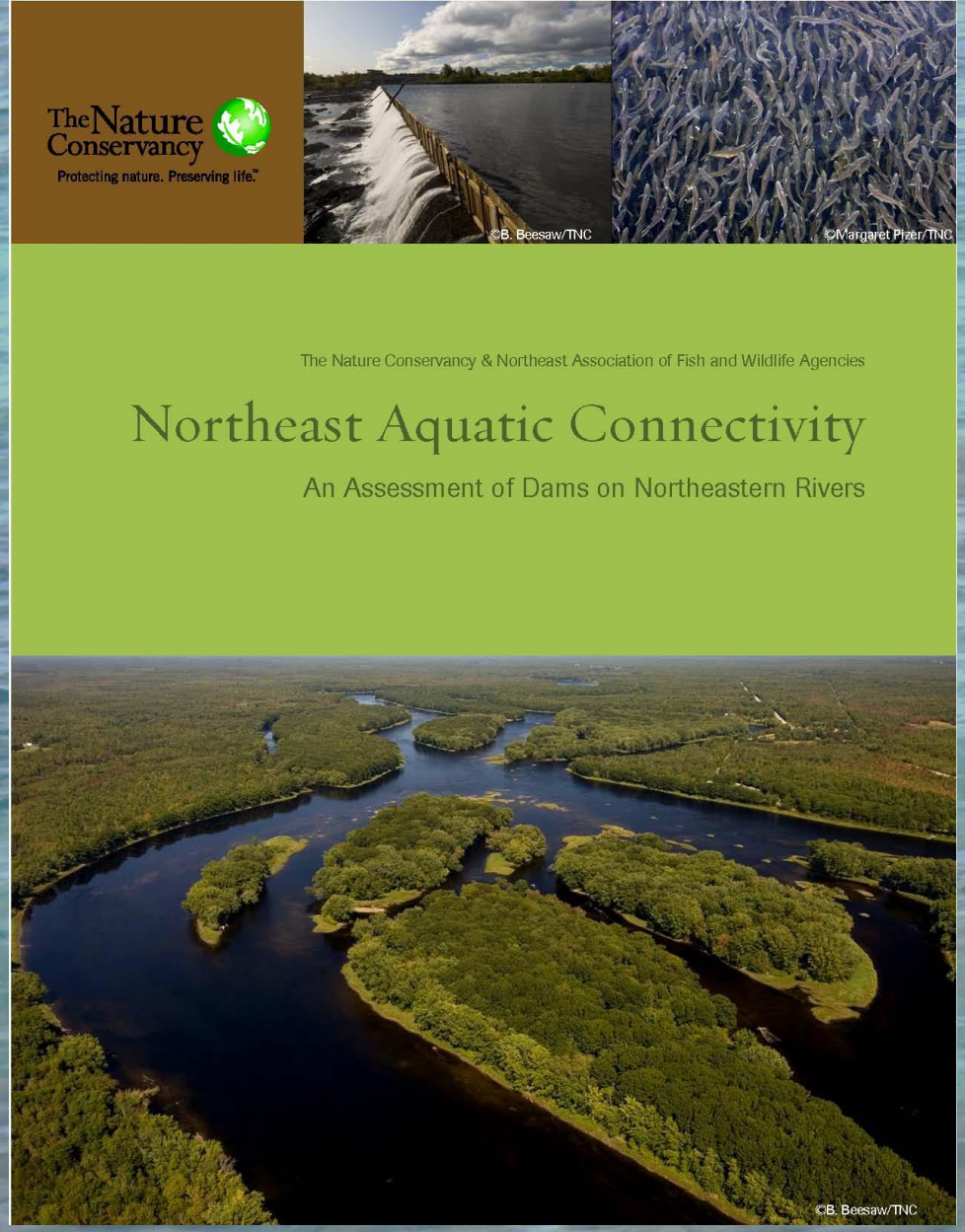
GOING WITH THE FLOW

Gephard- Getting Migratory Fish Over the Myriad of Barriers in Connecticut



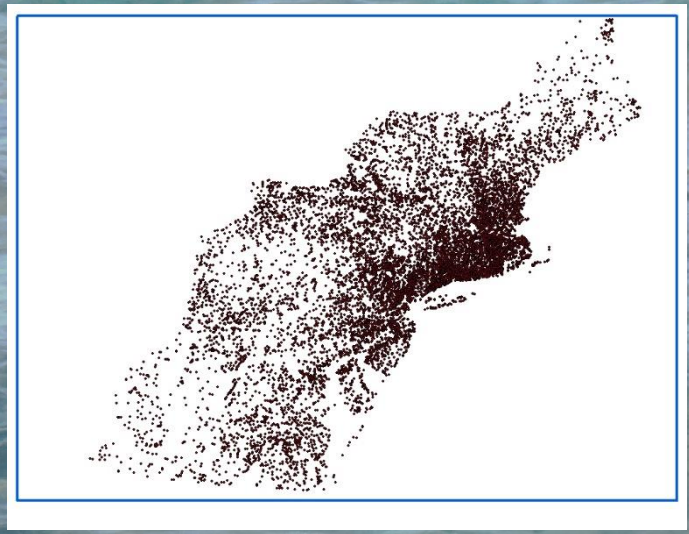


HABITAT IS CRITICAL. IF YOU'RE GOING TO REUNITE THE FISH WITH UPSTREAM HABITAT, THERE HAS TO BE VALUABLE HABITAT STILL IN PLACE UPSTREAM



- Worked with representatives from 13 northeastern states (agency and NGO, and academic)
- worked with existing dam databases
- converted all data into one compatible GIS database.
- analyzed 16 parameters to reflect value to anadromous fish

Number of downstream barriers
upstream dam density
Upstream functional network size
IS% in watershed
Number of upstream size classes
Number of road crossing
status of anadromous fish habitat
Number of hydro dams



Analysis provided a score for 13,000 dams throughout Northeast

From: Gephard & Harold. Prioritizing Dams. Salmon & Ecosystem Forum 2014

FINAL PRODUCT- RANKING OF 13,000 DAMS IN 13 NORTHEASTERN STATES

COLUMNS EXTEND OFF THE SCREEN TO THE RIGHT

STATE	NAME	Alt Name	Anadromous Weights Scenario Overall Percentile Results	Resident Weights Scenario Overall Percentile Results	Stream Name (NHD)	Town (ZIP overlay)	HUC12 NAME	River Size Class		Overall Rank
NY	079-0075		Top 5%	13th 5%	Sandy Creek	Adams	Sandy Creek	2 - Small Rivers		420
NY	080-5221		Top 5%	13th 5%	Salmon River	Altmar	Orwell Creek-Salmon River	3a - Med. Trib. Rivers		596
NY	081-0197		Top 5%	10th 5%	Little Salmon River	Mexico	Little Salmon River	2 - Small Rivers		559
NY	090-0126		Top 5%	5th 5%	Little Sandy Creek	Lacona	Little Sandy Creek	1b - Creeks		582
NY	122-0317		Top 5%	4th 5%	Grass River	Canton	Harrison Creek - Grass River	3a - Med. Trib. Rivers		638
NY	122-0327		Top 5%	2nd 5%	Grannis Brook	Canton	Grannis Brook	1b - Creeks		572
NY	122-0351		Top 5%	4th 5%	Grass River	Canton	Harrison Creek - Grass River	3a - Med. Trib. Rivers		635
NY	122-0368		Top 5%	6th 5%	Little River	Canton	Van Rensselaer Creek-Little River	2 - Small Rivers		433
NY	123-0432		Top 5%	Top 5%	Grass River	Russell	Plumb Brook - Grass River	3a - Med. Trib. Rivers		412
NY	123-0435		Top 5%	7th 5%	Elm Creek	Hermon	Elm Creek	2 - Small Rivers		282
NY	135-0149		Top 5%	4th 5%	Saint Regis River	Brasher Falls	Bell Brook-Saint Regis River	3a - Med. Trib. Rivers		404

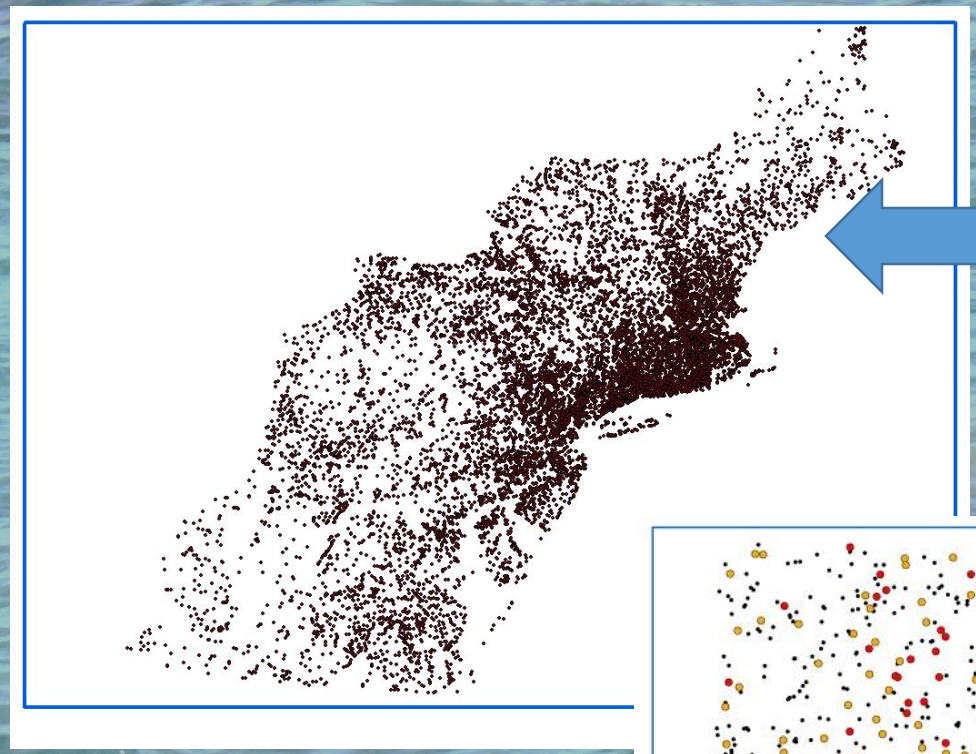
From: Gephard & Harold. Prioritizing Dams. Salmon & Ecosystem Forum 2014

Step 1- sort NCAT list by State and delete all states but CT (in all subsequent slides, we have hidden most of the columns to improve readability)

State	Dam name	bin tier	Stream	Town	Comments
CT	ASPINOOK POND DAM	1	Quinebaug River	Jewett City	FERC hydro. Re-license> 2020
CT	BLACKLEDGE RIVER DAM	1	Blackledge River	Glastonbury	first barrier, town park, near end of range
CT	COLEBROOK RIVER DAM	1	West Branch Farmington River	Riverton	ACOE FCD
CT	COMPENSATING RESERVOIR DA	1	East Branch Farmington River	New Hartford	MDC water dam
CT	HAMMONASSET DAM	1	Hammonasset River	Killingworth	SCRWA water dam
CT	STANCHEM DAM aka High Pond	1	Mattabesset River	East Berlin	dam 33-10 (aka High Pond Dam)
CT	HOCKANUM RESERVOIR	1	Hockanum River	East Hartford	no dam
CT	HOGBACK DAM	1	West Branch Farmington River	Riverton	MDC water dam
CT	KIMBALL POND DAM	1	Merrick Brook	Hampton	need to research
CT	LAKE HOUSATONIC DAM	1	Housatonic River	Derby	FERC hydro. Re-license> 2026
CT	LEESVILLE DAM	1	Salmon River	East Hampton	DEEP owned w/ salmon trap
CT	LEWIS POND DAM	1	Broad Brook	Preston	need to research
CT	MILL POND DAM	1	Scantic River	Somers	DEEP owned.
CT	MOULSONS POND DAM	1	Eightmile River	Old Lyme	owned by local dam group w/fishway
CT	NORTON PAPER COMPANY DAM	1	Jeremy River	Colchester	owned by local anti-gov't, Shelley
CT	OCCUM POND DAM	1	Shetucket River	Norwich	FERC hydro
CT	STONY BROOK POND DAM	1	Stony Brook	Suffield	does not exist

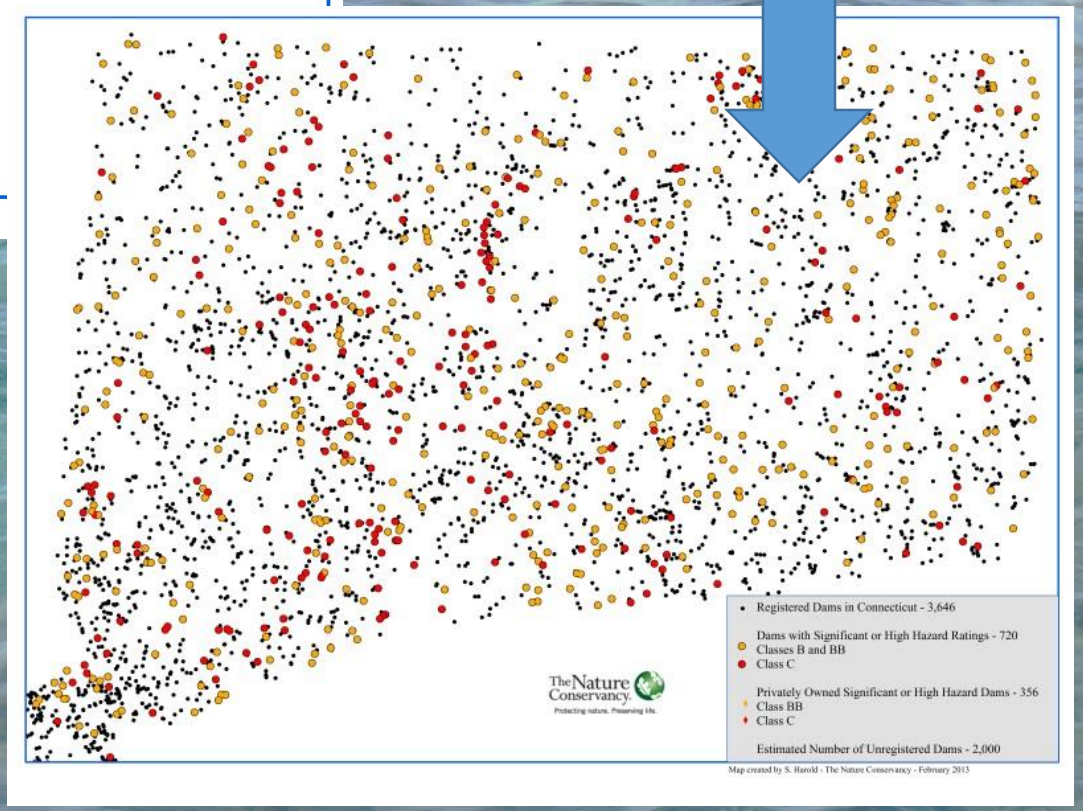
From: Gephard & Harold. Prioritizing Dams. Salmon & Ecosystem Forum 2014

Narrowing the Focus



From 13,000+ dams in 13 states

To 1,709 dams in 1 state



From: Gephard & Harold. Prioritizing Dams. Salmon & Ecosystem Forum 2014

Step 2- Assign each dam to category. Color coded each, then sorted by color to create separate lists.

- Priority for fish passage (dam removal or fishway)
- More info needed
- Does not exist
- Has a fishway
- Industrial (FERC hydro, Flood Control, Water Supply, etc.)

Purple= priority, yellow= more info needed, green= does not exist, blue= has fishway or eelpass, orange=

State	Dam name	bin tier	Stream	Town	
CT	ASPINOOK POND DAM	1	Quinebaug River	Jewett City	
CT	BLACKLEDGE RIVER DAM	1	Blackledge River	Glastonbury	
CT	COLEBROOK RIVER DAM	1	West Branch Farmington River	Riverton	
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CT	KIMBALL POND DAM	1	Merrick Brook	Hampton	
CT	LAKE HOUSATONIC DAM	1	Housatonic River	Derby	
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CT	LEWIS POND DAM	1	Broad Brook	Preston	need to research
CT	MILL POND DAM	1	Scantic River	Somers	DEEP owned.
CT	MOULSONS POND DAM	1	Eightmile River	Old Lyme	owned by local dam group w/fishway
CT	NORTON PAPER COMPANY DAM	1	Jeremy River	Colchester	owned by local anti-gov't, Shelley
CT	OCCUM POND DAM	1	Shetucket River	Norwich	FERC hydro
CT	STONY BROOK POND DAM	1	Stony Brook	Suffield	does not exist
CT	TARIFFVILLE DAM	1	Farmington River	Bloomfield	FRWA working to remove
CT	unnamed dam	1	Saugatuck River	Westport	Probably wood dam, Aquarion water dam
CT	UPPER MILL POND DAM	1	Indian River	Clinton	maybe land trust
CT	VERSAILLES POND DAM	1	Little River	Baltic	major contamination issues; fishway
CT	ADDISON POND DAM	2	Salmon Brook	Glastonbury	developer, d/s dam
CT	BIBBINS POND DAM	2	Beaver Brook	North Windham	not much habitat, benefit
CT	BILLS POND DAM	2	East Branch Eightmile River	Old Lyme	TNC/AR worki
CT	CAPELLO POND DAM	2	East River	Guilford	lake authority recreation w/fishway
CT	CELLU COMPANY DAM	2	Hockanum River	East Hartford	interested, but two d/s dams
CT	CHALKERS MILLPOND DAM	2	Oyster River	Old Saybrook	Town, valued, w/ fishway
CT	CHAPMAN POND DAM	2	Menunketesuck River	Clinton	working on fishway now, CRCCD
CT	COLLINS COMPANY LOWER DAM	2	West Branch Farmington River	Burlington	under FERC prelim permit, will have fishway
CT	COLLINS COMPANY UPPER DAM	2	West Branch Farmington River	Canton	under FERC prelim permit, will have fishway
CT	CREAMER DAM	2	Dismal Brook	North Granby	not much habitat, benefit
CT	DEER LAKE DAM	2	Chatfield Hollow Brook	Killingworth	above barrier falls

From: Gephard & Harold. Prioritizing Dams. Salmon & Ecosystem Forum 2014

Step 4- Refine individual lists. PRIORITY DAMS (N= 69)

Dam name	Comments	Criteria
NORTON PAPER COMPANY DAM	alternatives analysis underway	**High Priority**
BRUNSWICK MILL DAM #1	proposed for removal, DEEP, AR, NRCS	**High Priority**
MOOSUP RIVER DAM #1	proposed for removal, DEEP, AR, NRCS	**High Priority**
MOOSUP RIVER DAM #3	proposed for removal, DEEP, AR, NRCS	**High Priority**
BRISTOL BRASS DAM	planned for removal, CCRPA	**High Priority**
CHAPMAN POND DAM	fishway design funded, $ for construction anticipated	**High Priority**
FLOCK PROCESS DAM	City studying removal	**High Priority**
SMITH GRISTMILL DAM	FRWA working to install fishway, valued	**High Priority**
BUCKLEY DAM	to date, owner not interested - TNC contact w/ owner	**High Priority**
KAMAN TAILRACE DAM	proposed for removal, DEEP, AR, NRCS	**High Priority**
PAGES MILLPOND DAM	second dam on Farm River, TU project	**High Priority**
PATAGUANSET LAKE DAM	State-owned, natural lake, needs fishway	**High Priority**
SHUNOCK RIVER DAM	Town owned, above Parke Pond	**High Priority**
SPRINGBORN DAM	DEEP owned, considering removal.	**High Priority**
DENISON ROAD/TILEY-PRATT DAM	river herring to base! Leslie Lemay, local name= Tyl	**High Priority**
HYDE POND DAM	removal funded, town, w/fishway	**High Priority**
JOHNSON MILLPOND DAM	historic dam, fishway more likely than removal	**High Priority**
SIDE POND DAM (aka Parke Pond)	land trust now owns, wants to remove	**High Priority**

Ground-truthing. Inspect dams (esp. "More Info Needed") to be able to score dam.

There is a need for standardized reporting form so different parties collect the same necessary information. We developed a field form to guide this.

Page 1 of 2

CONNECTICUT

DAM REPORT- FISH PASSAGE ASSESSMENT

CTDEEP Inland Fisheries Division and The Nature Conservancy Cooperative Initiative

See glossary at bottom of page

DAM NAME ______________________ CT DAM NO. ______________

AKA ______________________ Hazard Rating ______________

Owner (if known) ______________________________

Information in box may be filled in back in office if not known by field crew.

Stream name ______________________ Town name ______________________

Field Notes on Location ______________________________

Date of visit ______________________ Streamflow: High Moderate Low Dry

Surveyor(s) ______________________ Part of a Stream Walk? Yes No

PHYSICAL DATA: (if measurements are estimates, use ~ symbol)

Dam (check one): does not exist ____ Is breached and does not impound water ____ barrier dam (continue) ____

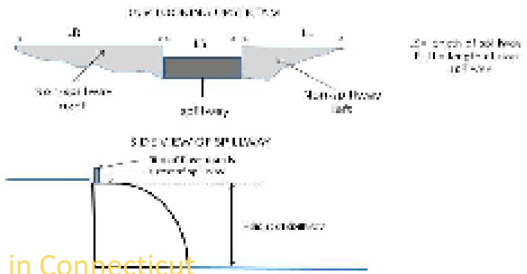
Height of crest of spillway over tailwater streambed ______________

Length of spillway ______________ Presence of flashboards? Yes No, If yes, height:________

Spillway Material (circle one): stone concrete wood stone capped with concrete

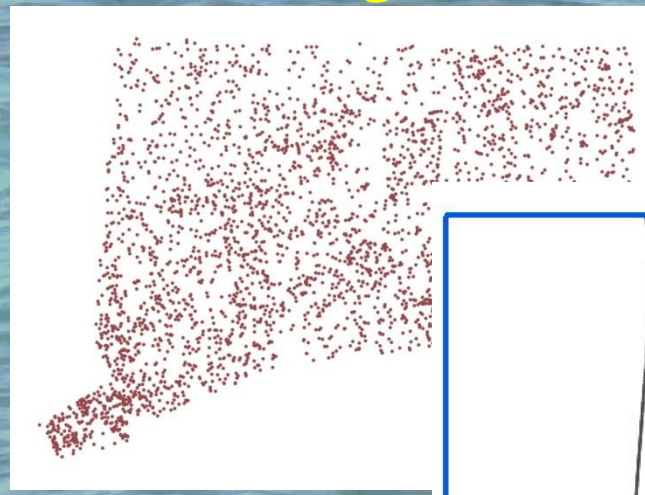
Material of non-spillway dam (circle one): earthen earth-filled stone-faced concrete stone

Height of non-spillway portion of dam (above spillway) ______________



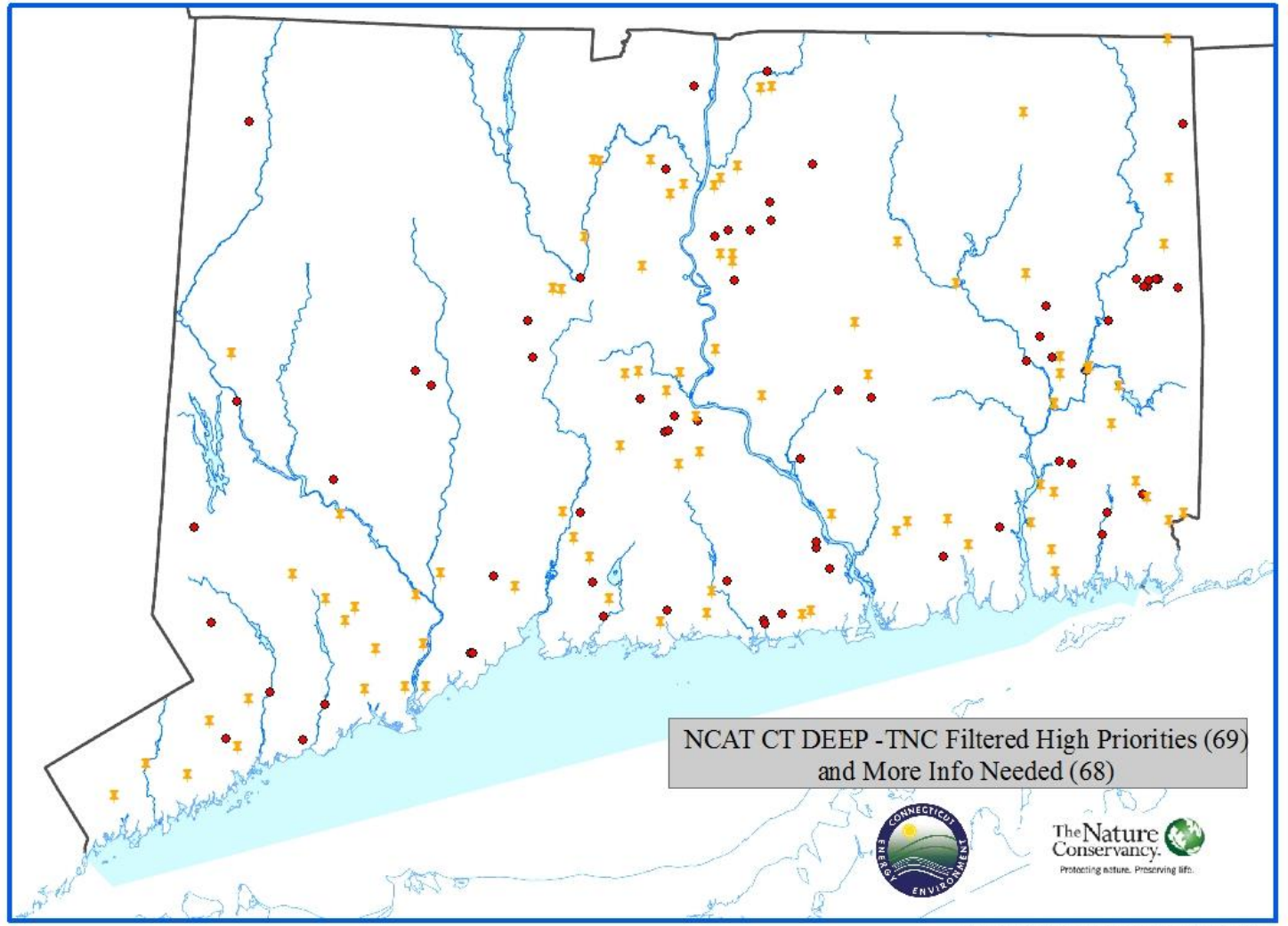
GLOSSARY: *Headpond-* Impoundment upstream of dam. *Tailwater-* stream below dam. *Races-* human-built canals for mills. *Headrace* at pond level; *tailrace* at lower stream level. Right bank is right when looking downstream, left bank is left looking downstream. *Flashboards* are boards erected on top of spillway to raise pond level further. *Stoplogs* or *weirboards* hold back water in canals or sluiceways. *Spillways* are dam sections where water is intended to flow. *Emergency spillways* deliberately spill water only during floods. *Gates* on dams intended to pass water to canals, millworks, or stream. *Low level outlets* are gates near bottom of dam used to drain pond. *Millworks-* anything associated with a former mill. *Remnants-* not boulders but solid edge. *Breach-* a significant hole or gap in dam.

Narrowing the Focus Again…



from 1,709 dams

to 69 dams, with an additional 68 (more info needed).



From: Gephard & Harold. Prioritizing Dams. Salmon & Ecosystem Forum 2014

The DEEP cannot do this alone!

- Partnerships with Municipalities and NGOs, like
  - The Nature Conservancy
  - Connecticut Fund for the Environment / Save the Sound
  - Connecticut River Conservancy
  - Farmington River Watershed Association
  - Trout Unlimited Chapters
  - Conservation Districts
  - Land trusts: Lyme, Branford, Avalonia, Old Saybrook Aspetuck….

- Grants from
  - NOAA
  - National Fish & Wildlife Foundation
  - U.S. Fish & Wildlife Service
  - America Rivers
  - EPA
  - DEEP
  - Various foundations

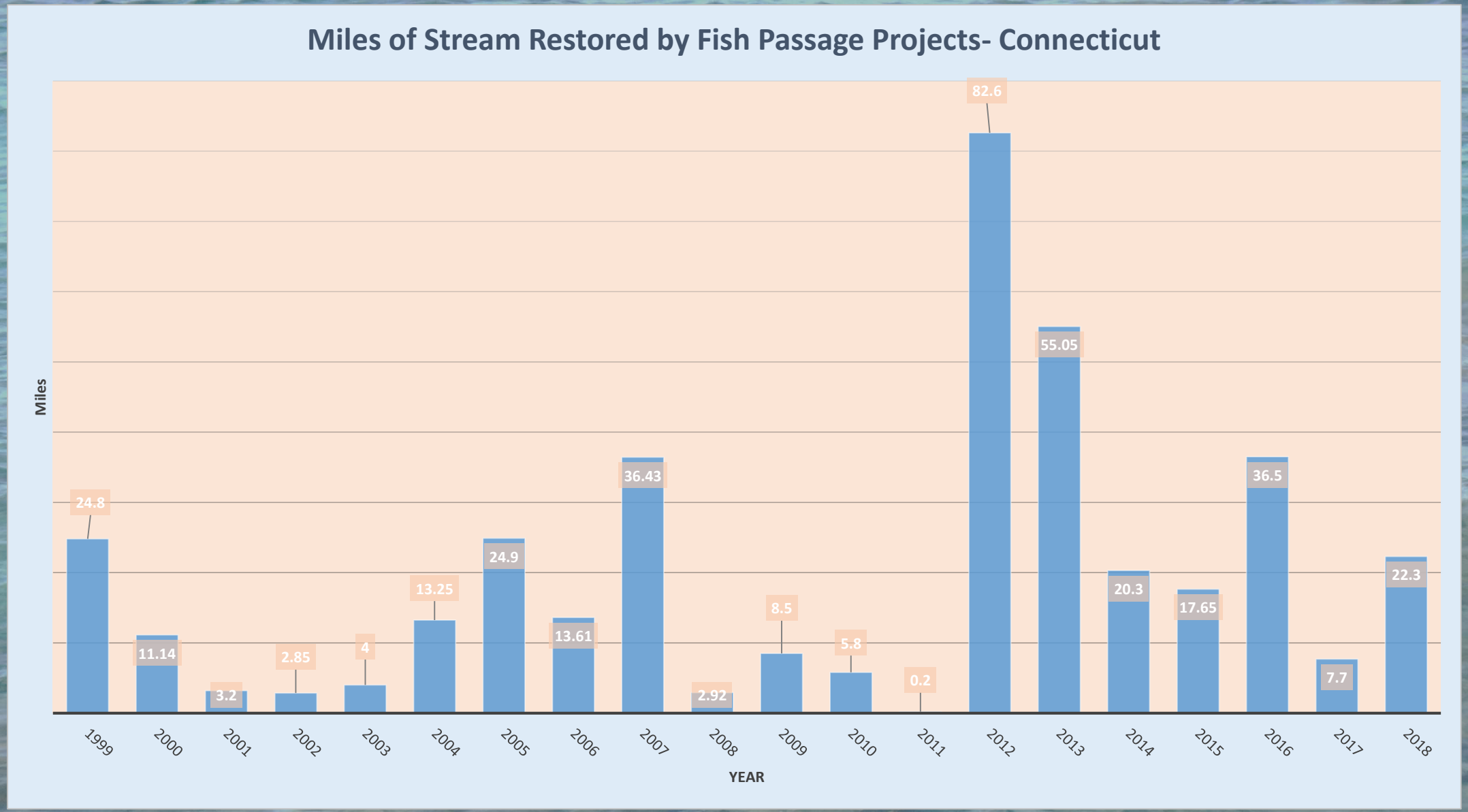
A successful model….

DEEP's Fisheries Division identifies the opportunities and recruits partners.
Partners establish agreements with dam owners and develop community relations.
Partners apply for grants to design projects.
DEEP and USFWS help guide the design. Biologists & Engineers.
Once designed, partners apply for grants to build.
Partners apply for permits.
Partners hire contractors.

The DEEP never leaves the project. Provides technical assistance before, during, and after construction.

In addition to the proactive, community-based efforts, the CTDEEP also seeks fish passage through the regulatory process.

- Hydroelectric projects that need federal licenses and State permits can be required to build fishways as a condition of these licenses/permits
- Anyone seeking to repair or build dams in Connecticut must obtain a permit from the DEEP. The construction of a fishway may be included as a condition to such permits
- Sometimes fishways or dam removals are funded as mitigation for such environmental violation or a permitted project that has unavoidable impacts.


Miles of Stream Restored by Fish Passage Projects- Connecticut
Miles
YEAR
1999
2000
2001
2002
2003
2004
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2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
24.8
11.14
3.2
2.85
4
13.25
24.9
13.61
36.43
2.92
8.5
5.8
0.2
82.6
55.05
20.3
17.65
36.5
7.7
22.3

Results--

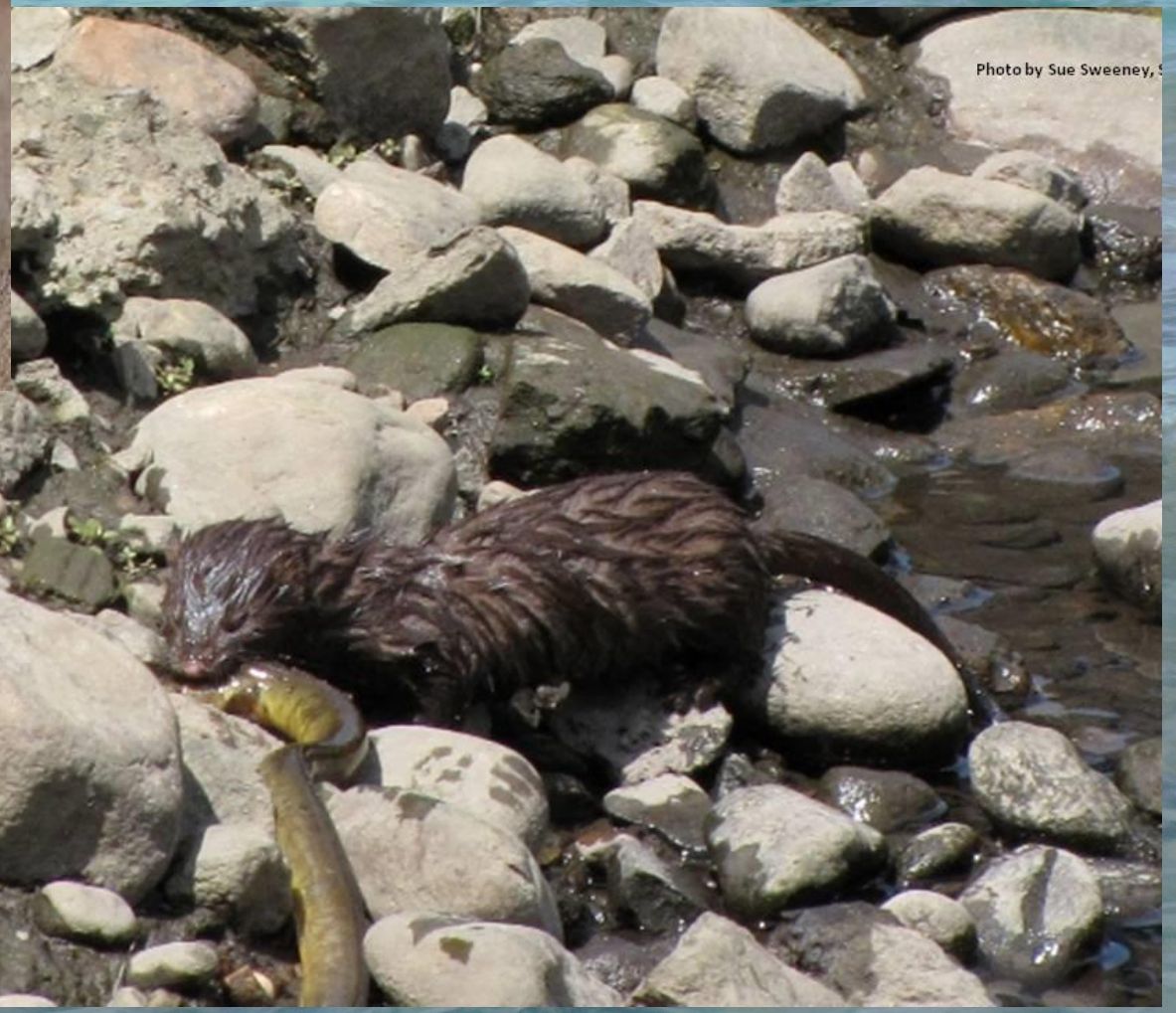
Fish are using the fishways…

Citizens are visiting the fishways…

Fish runs are increasing…

More communities want to address their dams!

IT'S NOT ALL ABOUT JUST FISH…



GOING WITH THE FLOW

Gephard- Getting Migratory Fish Over the Myriad of Barriers in Connecticut

SOME RECENT DAM REMOVALS

Blackledge River Dam, Blackledge River, Glastonbury, CT
Sponsor- Town of Glastonbury
2017-2018

SOME RECENT DAM REMOVALS

Blackledge River Dam, Blackledge River, Glastonbury, CT
Sponsor- Town of Glastonbury
2017-2018

SOME RECENT DAM REMOVALS

Norton Mill Dam, Jeremy River, Colchester, CT
Sponsor- The Nature Conservancy
2016-2017

SOME RECENT DAM REMOVALS

Norton Mill Dam, Jeremy River, Colchester, CT
Sponsor- The Nature Conservancy
2016-2017

SOME RECENT DAM REMOVALS

Flock Process Dam, Norwalk River, Norwalk, CT
Sponsor- City of Norwalk
2017-2018

SOME RECENT DAM REMOVALS

Old Papermill Pond Dam, East Aspetuck River, New Milford, CT
Sponsor- The Nature Conservancy
March 2019

BEFORE

AFTER

SOME RECENT DAM REMOVALS

Macedonia Brook Dam, Macedonia Brook, Kent, CT
Sponsor- Trout Unlimited/DEEP
2018

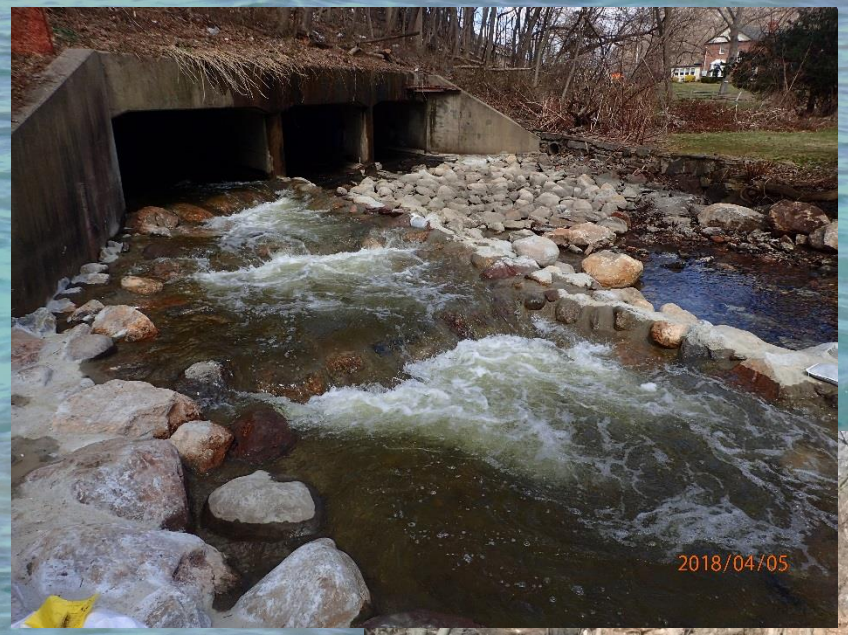
SOME RECENT FISHWAY CONSTRUCTION

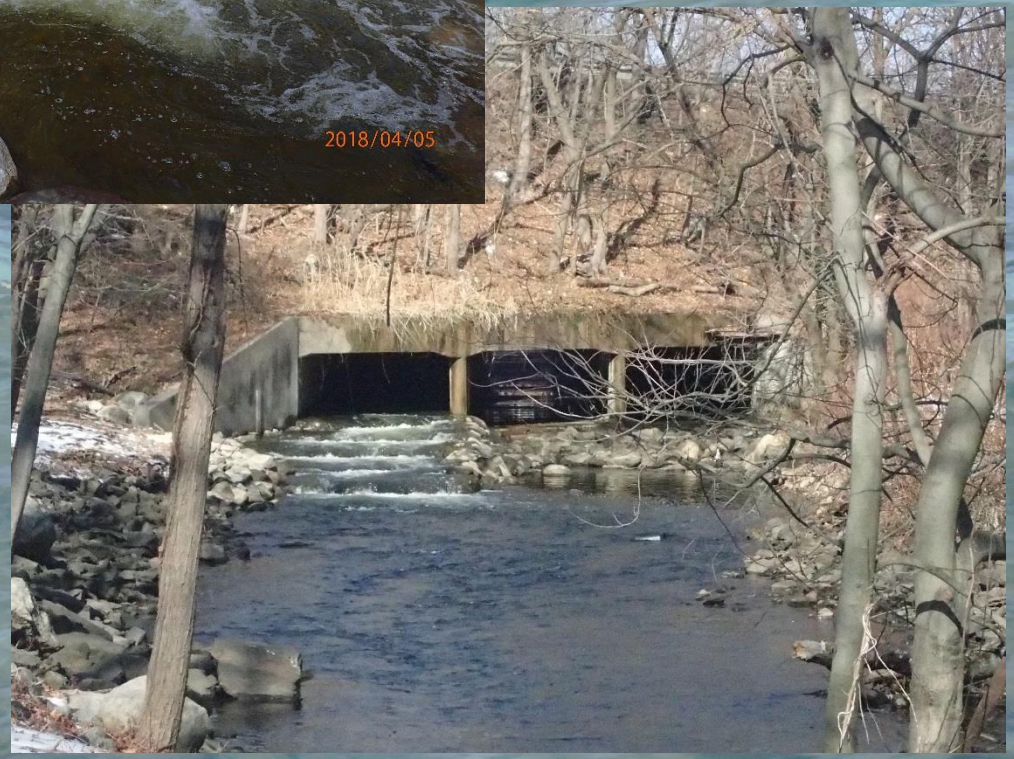
Chapmans Pond Fishway, Menunketesuck River, Clinton, CT
Sponsor- Connecticut River Coastal Conservation District/DEEP
2016

SOME RECENT FISHWAY CONSTRUCTION

Upper Pond Fishway, Goodwives River, Darien, CT
Sponsor- Town of Darien
2016

SOME RECENT FISHWAY CONSTRUCTION





Noroton Culvert Fishway, Noroton River, Stamford, CT
Sponsor- Connecticut Fund for the Environment/STS
2018

SOME RECENT FISHWAY CONSTRUCTION

Scotland Dam Fishlift,
Shetucket River, Windham, CT
Sponsor- FirstLight Power
2018

Summary-

- This approach has been working well to address migratory barriers for fish.
- This approach is mostly voluntary and has been very popular with both dam owners and conservation groups that want to get involved.
- These projects are popular destinations for the public. Many groups provide regular tours to their fishways and hold open houses.

Summary (cont.)-

- The new dam safety regulations are supportive of this approach. More regulations are needed.
- As the DEEP continues to lose capacity, the use of partnerships with NGOs is even more critical.
- Budget cuts in Washington reduce federal grant programs; most inexpensive projects have already been done– hard to find money for the balance.
- Federal grants require non-federal match. If we cannot find new sources of non-federal money, we will leave federal money on the table and scale way back on these efforts.