Streamlining Permitting for Restoration – Dam Removal

Dam Busters 201
MassRivers webinar
May 7, 2025

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Mass Audubon

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Streamlining Dam Removal

DAM BUSTERS PRESENTATION, MAY 7, 2025
MICHAEL CHELMINSKI, P.E., STANTEC CONSULTING SERVICES INC.

Mass Audubon 2021-26 Action Agenda

Ambitious, Interconnected Goals

Goal 1

Protect and Steward Resilient Landscapes

Goal 2

Advance Inclusive and Equitable Access to Nature

Goal 3

Mobilize to Fight Climate Change

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Takeaways from today:

1. Dam Removals are beneficial and support purposes of environmental laws

2. Scope of Need is Large

3. Permitting is a Challenge

4. Solutions

Photos of rivers and wetlands by Alex Hackman @ Mass Audubon and MA Division of Ecological Restoration unless noted

We can define it…

Ecological Restoration

"The process of assisting the recovery of an ecosystem that has been damaged, degraded, or destroyed"

Assisting in recovery means…

- Repairing processes
- Restoring connectivity
- Involving people

1. **Help nature to take care of itself**

   Identify stressors that limit recovery, carefully plan and take actions to repair key processes, monitor changes, and help ecosystems heal themselves.

2. **Remove barriers to re-connect ecosystems**

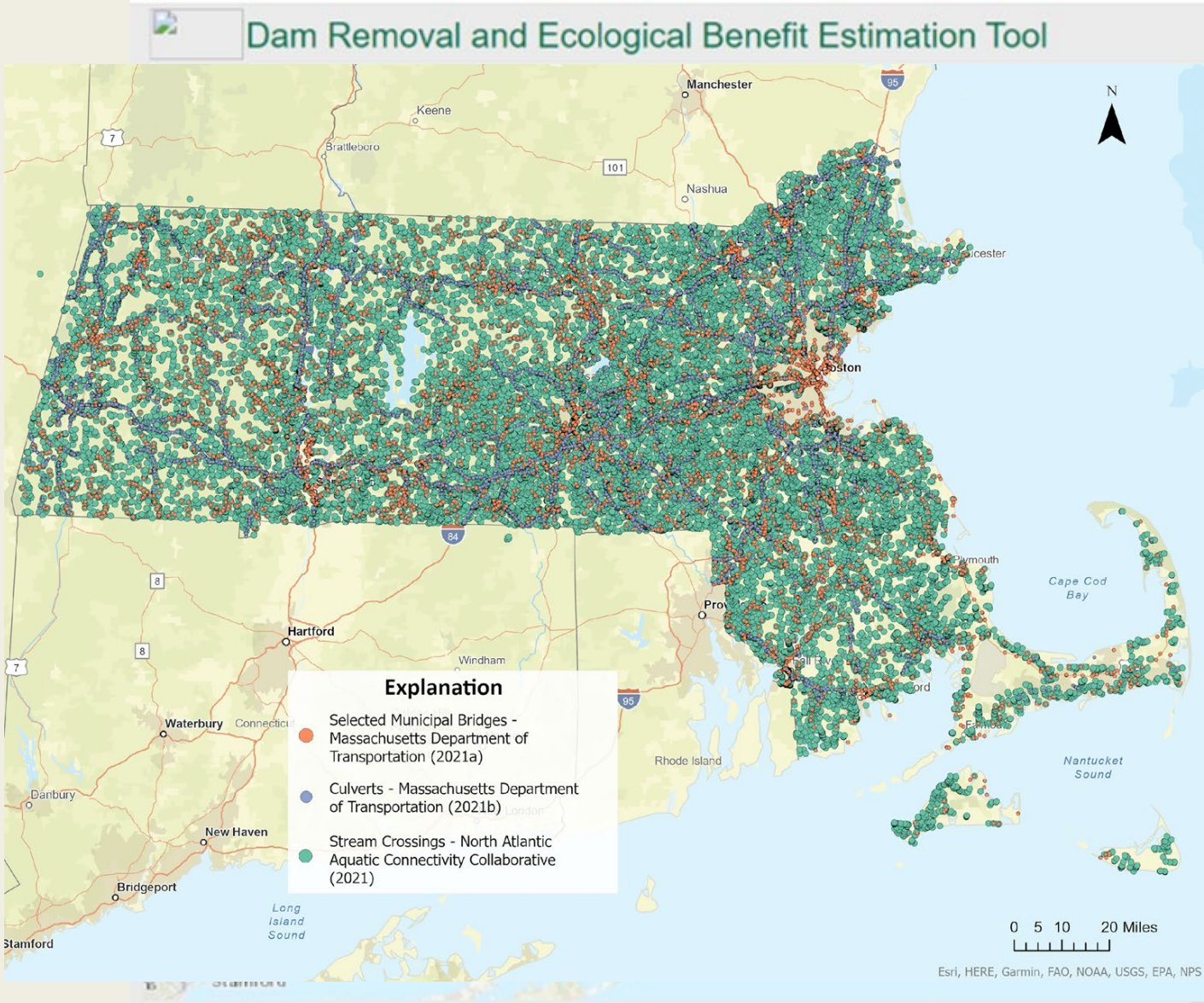
   Well-connected ecosystems allow organisms, energy, and material to flow freely across the landscape within and between different habitats.

3. **Engage people for wisdom and long-term care**

   We succeed by listening to and working with neighbors, farmers, Tribes, watershed groups, politicians, and many others.

The Need: Increase Scope, Pace of Restoration

- **Salt Marshes**
  - 45,000 acres remaining
  - 41% lost historically
  - Thousands of acres need immediate restoration
- **Dams**
  - 3,000
  - Many obsolete, poor condition
- **Culverts**
  - 25,000
  - Barriers to fish and wildlife
  - Increasing risk of road washouts
- **Cranberry bogs**
  - Thousands of acres no longer in production
  - Prime opportunities especially along coast



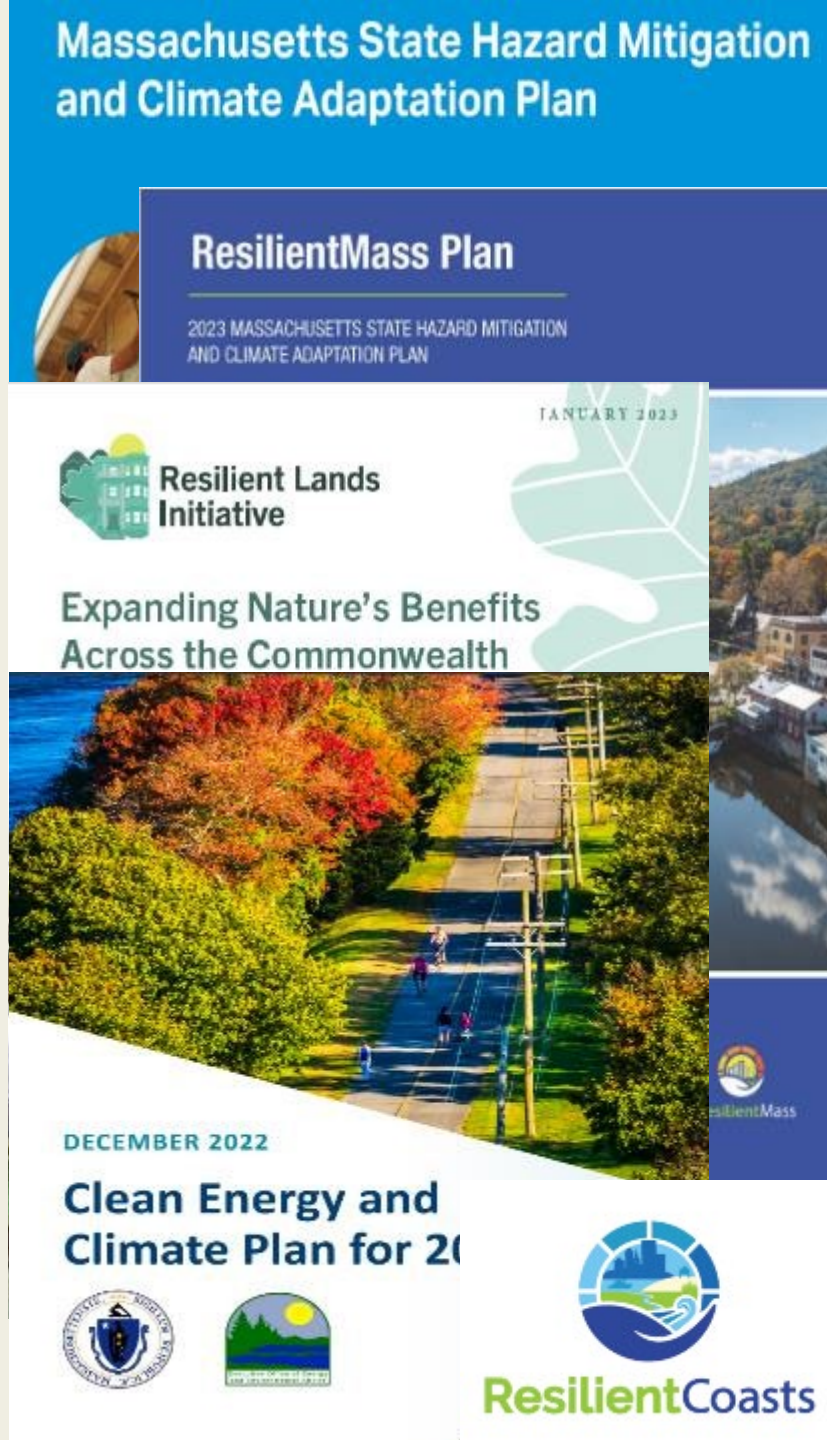
State Policy & Planning Context

Restoration is essential to state goals.

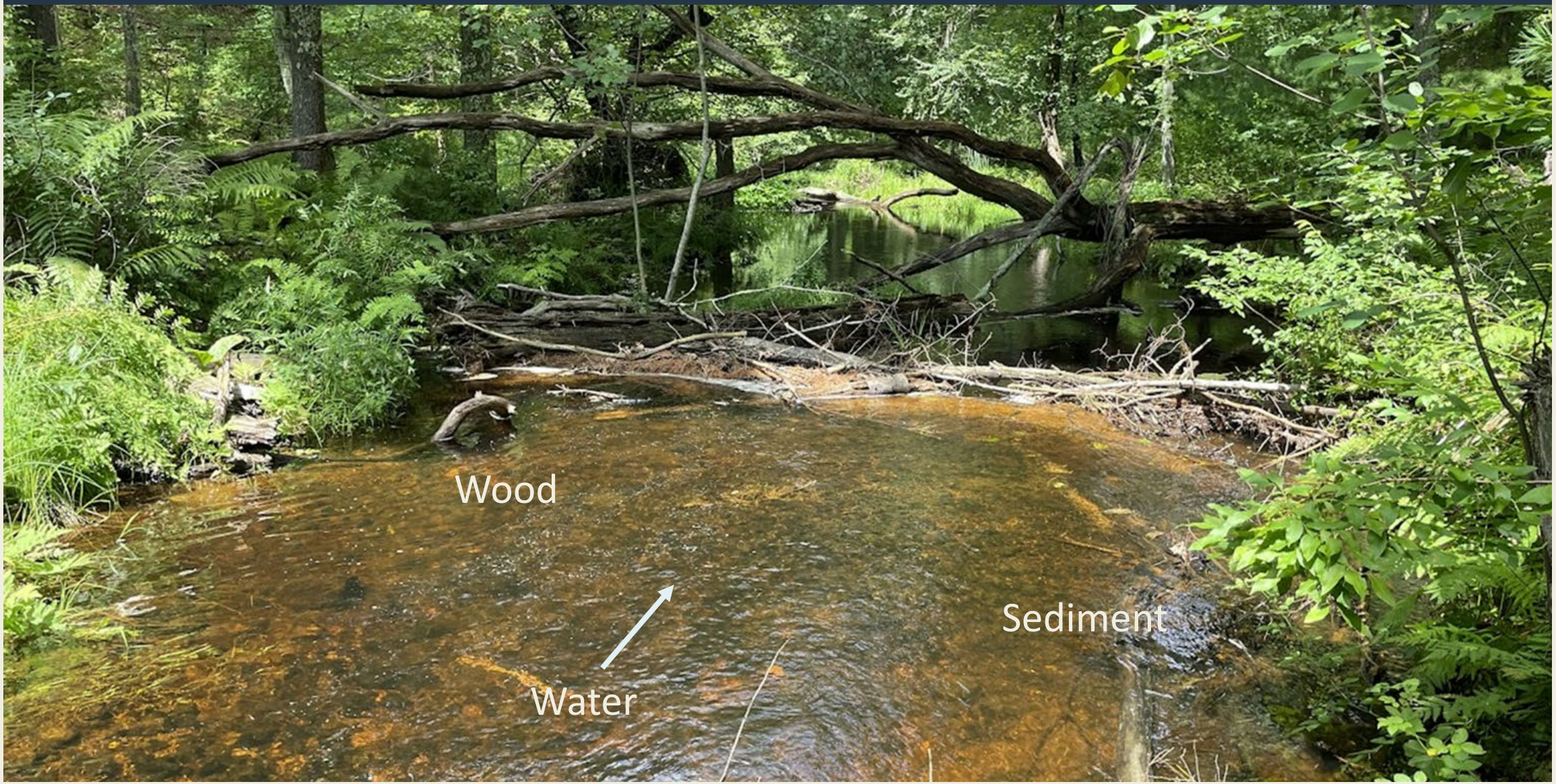
- ★ Climate adaptation and resilience
- ★ Climate change mitigation
- ★ Enhancing biodiversity
- ★ Ensuring environmental justice

…"the Department [of Fish and Game] recognizes a need to collaborate with municipal, state, and federal agencies to improve and streamline permitting pathways and guidelines to accelerate the pace of ecological restoration, climate mitigation, and climate adaptation projects."

DFG Strategic Plan, 2024



Framing question: How do healthy rivers make habitat?



Bartlett Rod Shop Co. Dam (c. 2012) looking upstream
Amethyst Brook, Pelham, MA

Bartlett Rod Shop Co. Dam Removal (c. 2012) looking downstream
Amethyst Brook, Pelham, MA

For 150+ years…sediment and wood trapped upstream; fish unable to reach cold headwaters
“Degraded” = long term negative impact.

The good news: This dam WAS REMOVED

Engineered by Stantec Consulting Services. Constructed by SumCo Eco-Contracting

Following dam removal, sea lamprey returned for first time in decades

Contents lists available at ScienceDirect

Geomorphology

journal homepage: www.elsevier.com/locate/geomorph

Immediate changes in stream channel geomorphology, aquatic habitat, and fish assemblages following dam removal in a small upland catchment

F.J. Magilligan [a,*], K.H. Nislow [b], B.E. Kynard [c], A.M. Hackman [d]

[a] Department of Geography, Dartmouth College, Hanover, NH, USA
[b] USDA Forest Service: Northern Research Station, Amherst, MA, USA
[c] Department of Environmental Conservation, University of Massachusetts, Amherst, MA, USA
[d] Massachusetts Division of Ecological Restoration, Boston, MA, USA

2 years later: Critical river processes restored, healthier river, and no negative impacts

Existing laws and regulations make this very hard…why?

Reminder: The purpose of the Federal Clean Water Act is to "to **restore** and maintain the chemical, physical and biological integrity of the Nation's waters

How much effort?

Approximate #s from one example

- 5 public hearings
- 10 grant applications
- 7+ permits and approvals taking > 1 year

Goal: Restore and Reconnect

- Remove fill, water control structures
- Restore river processes and stream connectivity
- Restore fish and wildlife habitat
- Eliminate flood hazards from dam failures
- Restore and reconnect floodplains
- Restore bordering wetlands
- Improve public access and navigation

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Streamlining Dam Removal

DAM BUSTERS PRESENTATION, MAY 7, 2025
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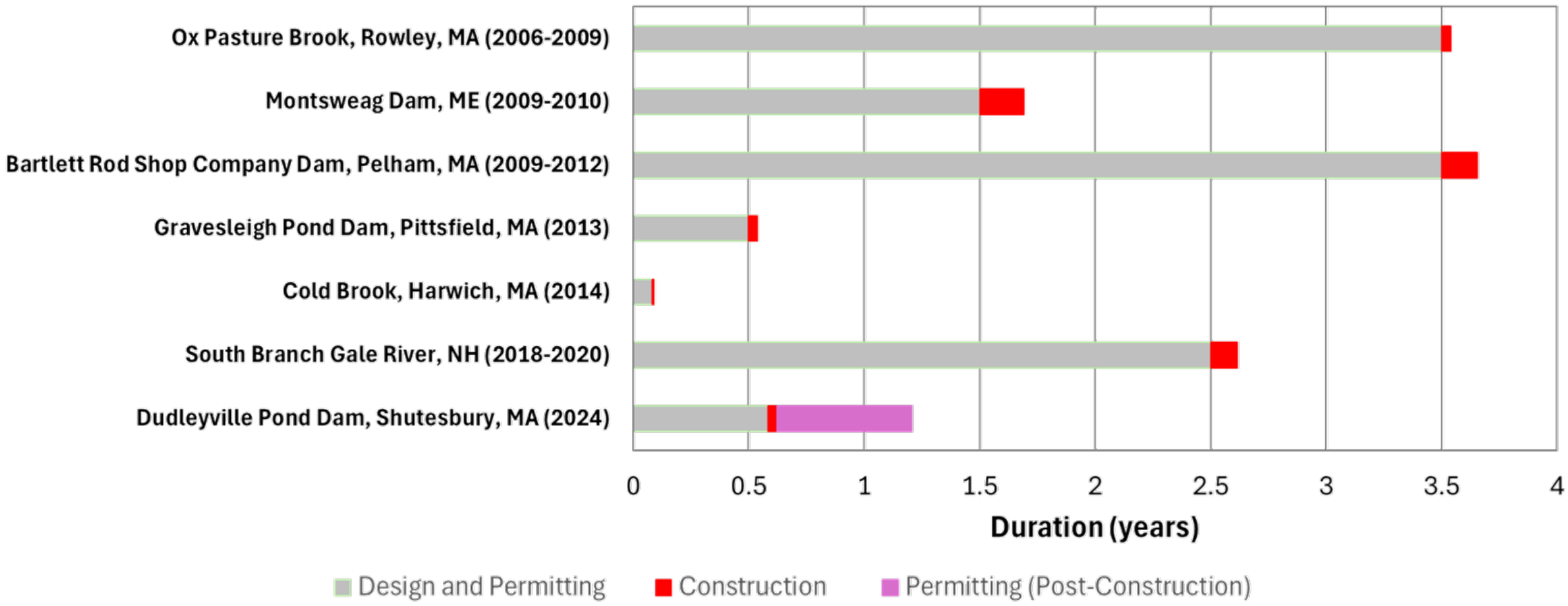
Agenda

1. Introduction
2. Dam Removal Timelines
    a) Ox Pasture Brook, Rowley, MA (2006-2009)
    b) Montsweag Dam, ME (2009-2010)
    c) BRSCD, Pelham, MA (2009-2012)
    d) Gravesleigh Pond Dam, Pittsfield, MA (2013)
    e) Cold Brook, Harwich, MA
    f) South Branch Gale River, NH
    g) Dudleyville Pond Dam, Shutesbury, MA (2024)
3. Closure

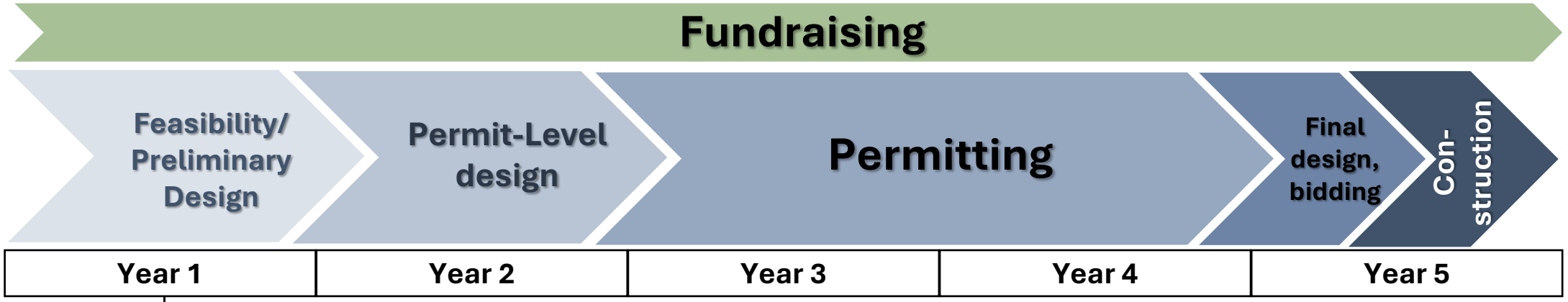
Example Dam Removal Projects in Graphical Format



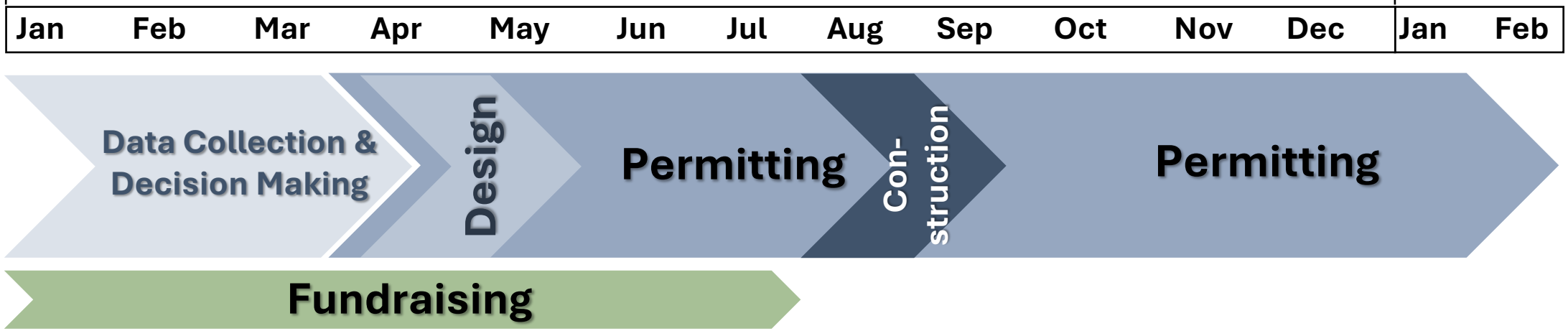
Example Dam Removal Projects (2006-2024)

Dam Removal Project	Project Duration (design and permitting)	Construction Duration
Ox Pasture Brook, Rowley, MA	2006-2009+	2 weeks
Montsweag Dam, ME	2009-2010+	10 weeks
Bartlett Rod Shop Company Dam, Pelham, MA	2009-2012	8 weeks
Gravesleigh Pond Dam, Pittsfield, MA	2013+	2 weeks
Cold Brook, Harwich, MA	2014 (<1 month)	2 days
South Branch Gale River, NH	2018-2020	6 weeks
Dudleyville Pond Dam, Shutesbury, MA	2024 (~7 months)	2 weeks

Typical Dam Removal Process



Dudleyville Dam Removal Process



Ox Pasture Brook Dam

Location:

Head-of-tide dam in William Forward Wildlife Management Area, Rowley, MA

Objective:

- Restore intertidal habitat & aquatic habitat continuity

Constraints:

- Environmental contaminants
- Construction access

Ox Pasture Brook Dam

2006 to 2009 project timeline + post-construction monitoring

3 years planning, design, permitting

2 weeks dam removal construction

2010 to 2012 post-construction monitoring

Ox Pasture Brook Dam, Rowley, MA

Impoundment During and 10 Months After Construction

- December 2009 (construction [bottom image])
- September 2010 (post-construction [right image])

✓ Post-construction sampling terminated after 3 years when no difference from background identified

Montsweag Dam

Location:

Head-of-tide dam on Montsweag Brook, Wiscasset and Woolwich, ME

Objective:

- Restore aquatic habitat and connectivity as part of Natural Resources Damages Settlement for closure of Maine Yankee Facility

Basis:

- Dam removal can restore natural resources, including aquatic habitat and connectivity

Montsweag Dam

2009 to 2010 project timeline + plus post-construction monitoring

1.5 years design, permitting

10 weeks dam removal construction

Montsweag Dam Removal

“Low tide” scenario less than one growing season

Bartlett Rod Shop Co. Dam

Location:

Amethyst Brook in Pelham, MA.
First dam upstream from CT River.

Objectives:

- Remove legacy infrastructure
- Restore habitat continuity and sediment transport

Constraints:

- Sediment volume
- Adjacent infrastructure

Bartlett Rod Shop Co. Dam

2009 to 2012

3 years design & permitting

8 weeks of construction

4,000 CY repositioned sediment

Restoration of downstream spawning habitat for sea lamprey (seen in June 2013)

Bartlett Rod Shop Co. Dam, Amethyst, Brook, Pelham, MA

Impoundment During and 6 Months After Construction

- November 2012 (construction [right image])
- June 2013 (post-construction [bottom image])

Amethyst Brook in location of former Bartlett Rod Shop Co. Dam (Pelham, MA)
June 22, 2013

Bartlett Rod Shop Company Dam Removal:

Alteration of Downstream Fluvial Processes

Downstream Channel Evolution
Post-Dam Removal

October 26, 2012

November 9, 2012

December 6, 2012

April 14, 2013

May 10, 2013

June 6, 2013

Bartlett Rod Shop Company Dam Removal:

Alteration of Upstream Fluvial Processes

Upstream Channel Evolution Post-Dam Removal

May 28, 2013

July 7, 2013

April 5, 2014

May 22, 2014

Bartlett Rod Shop Company Dam Removal:

(2009-2012)

Amethyst Brook Dam Removal Lessons Learned

Evolution of regulatory/stakeholder consultation processes:

- *Primary concern regarding release of sediments was impacts to downstream sediment*
- *Some stakeholders wanted more release of coarse sediment*

Instream sediment management was recognized as feasible and cost effective

Evolution of the process:

- Dam failure was the likely alternative to dam removal
- Dam removal design was largely “engineered dam failure”

- Question: *If dam safety regulations do not typically consider contaminated sediment as part of the hazard classification…*

Gravesleigh Pond Dam

Location:

Sackett Brook, Mass Audubon Canoe Meadows Wildlife Sanctuary, Pittsfield, MA

Project Objective:

- Restore aquatic and riparian habitat continuity

Project Constraints:

- Environmental contaminants
- RTE species

Gravesleigh Pond Dam

6 years of project planning

1 year design plans & permitting

2 weeks dam and bridge removal

Gravesleigh Pond Dam Removal, Sackett Brook, Pittsfield, MA

Sackett Brook during completion of construction

- November 2019 (during completion of construction)
- Additional floodplain restoration (woody vegetation planting) in 2015

➢ Five years of post-construction monitoring

Carding Mill Dam

Location:

Cold Brook, Harwich, MA

Project Objective:

- **Reconnaissance Study** to restore aquatic and riparian habitat continuity

Project Constraints:

- Tidal influence
- Infrastructure (upstream and downstream culverts)

Project Opportunity:

- Eliminate impacts to aquatic habitat from dam failure

Carding Mill Dam Removal

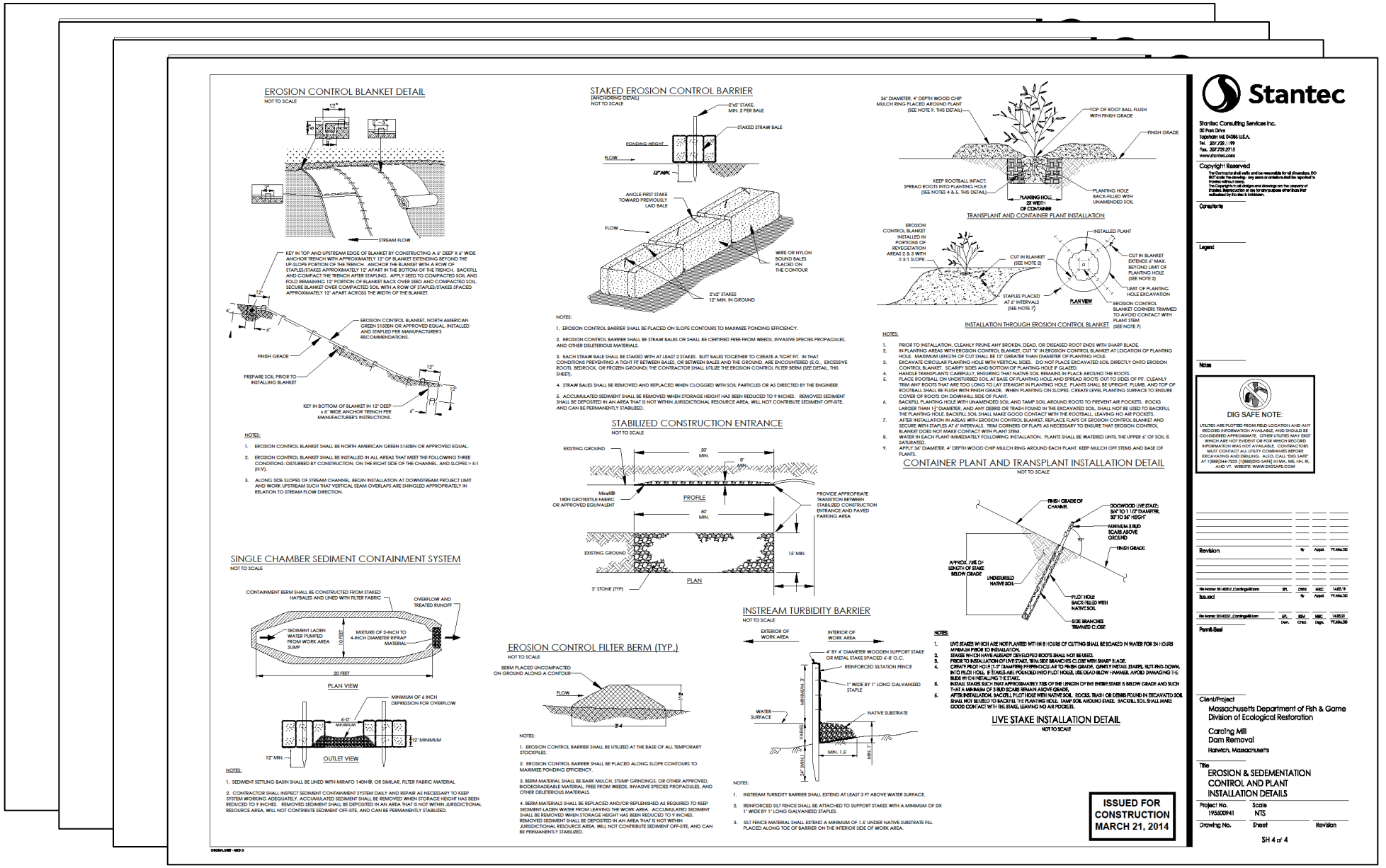
1 month of project planning

20 days design plans & permitting

2 days dam removal

Carding Mill
Dam Removal:
Design Approach

Design Plans Based on Project Need



4 sheets

Carding Mill Dam Removal, Cold Brook, Harwich, MA

Construction, March 24 and 25, 2014

- Best Management Practices (March 25, 2014)
- Post-Construction Drive-By (May 7, 2014)

South Branch Gale River Dam

Location:

- South Branch Gale River, White Mountain National Forest

Project Objective:

- Restore aquatic and riparian habitat continuity

Project Constraints:

- Located on National Forest
- Steep channel (~5% slope)
- Infrastructure (downstream bridge, remnant water supply system)

Project Opportunity

- Partnership with NHDES

South Branch Gale River Dam Removal

2 years design & permitting

6 weeks of construction

South Branch Gale River Dam Removal, Bethlehem, NH

Project History

- **Reconnaissance Study – June 2018**
- Dam removal identified as opportunity for mitigation and enhancement of ongoing hydroelectric operations
- Partnership with American Rivers (project proponent), Littleton Water & Light District (dam owner), US Forest Service (landowner), New Hampshire Department of Fish & Game, New Hampshire Department of Environmental Services
- **Permitting by New Hampshire Department of Environmental Services**
- **Dam removal substantially completed in early-fall 2020**

Dudleyville Pond Dam

Location:

- Unnamed tributary to Sawmill River, Shutesbury, MA

Risks:

- "Significant" Hazard Class Dam
- "Unsafe" Condition Dam

Objective:

- Restore aquatic habitat and connectivity

Opportunities:

- Improve public safety

Dudleyville Pond Dam Removal

2024

7 months design & permitting

2 weeks of construction

Dudleyville Pond Dam Removal

Project History

- **Reconnaissance Study – June 2018**
- Dam removal identified as opportunity for mitigation and enhancement of ongoing

Theme: Not Every Project is Complicated

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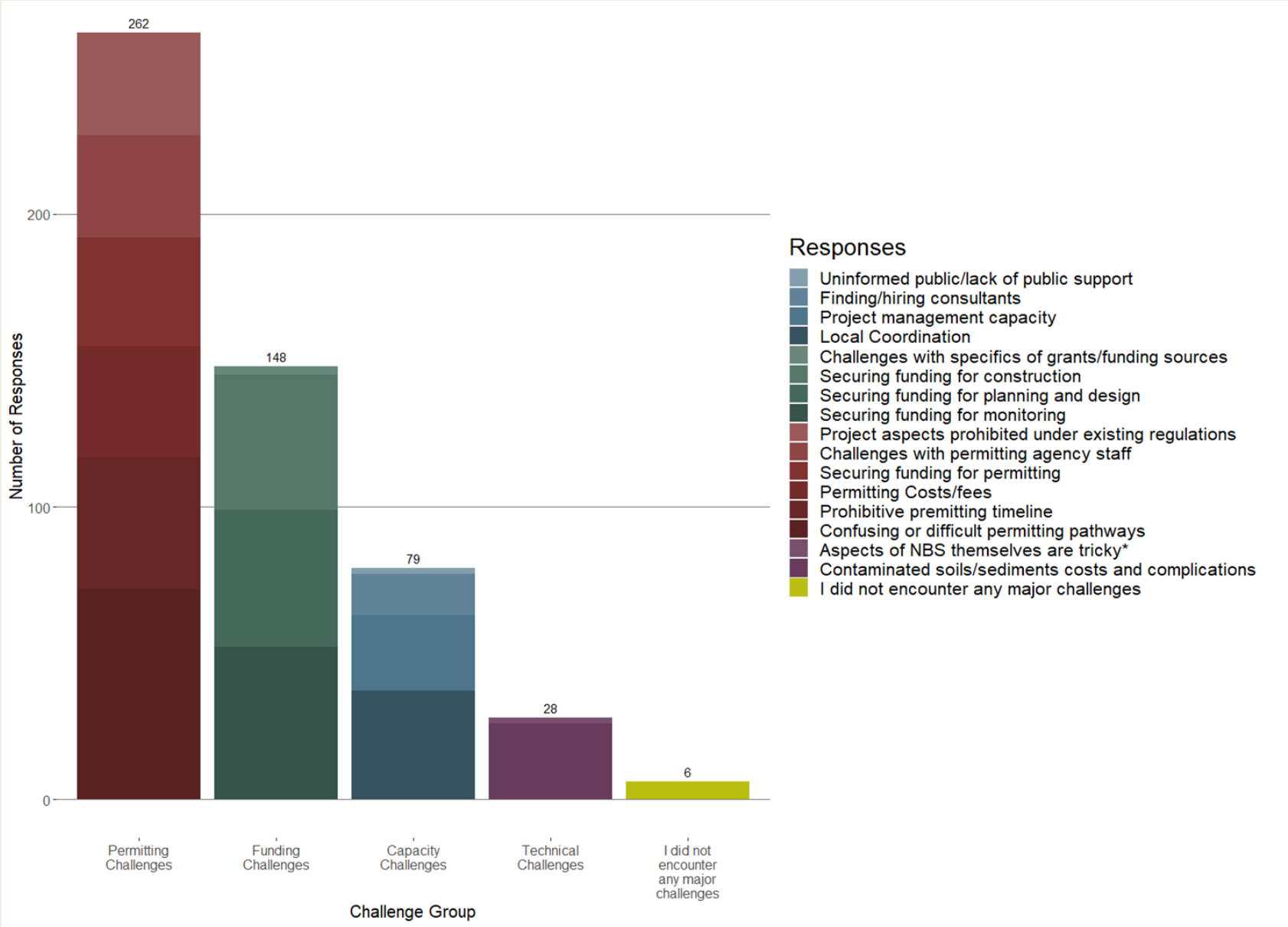
What are the barriers?

CLF and Mass Audubon conducted research to understand barriers to this work

- Survey with 139 respondents across multiple sectors
- Additional in-depth interviews to dig in more

Major barriers:

- Most common is confusing or difficult **Permitting**
- **Funding** and **Capacity** were also frequently cited



CLF and Mass Audubon research

- Survey with 139 respondents across multiple sectors
- Additional in-depth interviews

Takeaways

- A sense of **urgency** and a **need to innovate**
- A **lack of coordination and consistency** from agencies
- A **desire for more partnership** between practitioners and regulatory agencies
- **Challenge of balancing** strong environmental protections while also supporting and moving forward beneficial projects

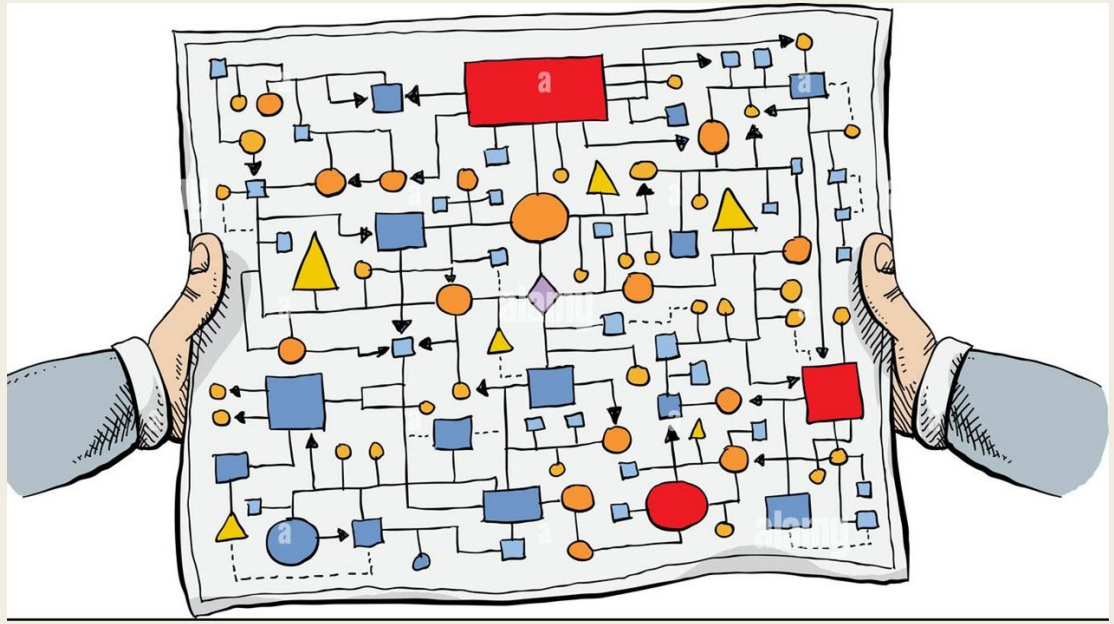
"The permitting system, the regulatory system, needs to **allow innovation** to proceed, but not just give it a blank check."

"Quite frankly, it's not just simply tweaking how the regulatory world operates and the applicants work, but more literally a true partnership. **We need a new model** that says we're gonna work together to solve the problem, pool our land pool, our resources, our knowledge."

Complex Regulatory Framework

Designed for development, not restoration

- Wetlands Protection Act and local bylaws
- DEP 401 Dredging and WQ Certification
- DEP Ch. 91 Tidelands licensing
- Coastal Zone Management
  federal consistency review
- Areas of Critical Environmental Concern
- MA Endangered Species Act
- Massachusetts Environmental Policy Act
- Army Corps of Engineers – General Permit



And more….

Unless we greatly accelerate the pace of restoration now, we will lose critical ecosystem services and will require more expensive and invasive restoration techniques

Regulatory Barriers: Complex, Costly, Time-Consuming Permits

- **Complex:** Up to a dozen permits
- **Costly:** Tens to hundreds of thousands of dollars
- **Time Consuming:** 1-5 years, plus multi-year, complex, post-construction monitoring
- **Particularly burdensome for:**
    - EJ or under-resourced communities and NGOs, and
    - Urban greening, riverfront and shoreline restoration projects that already face high land costs, contamination, demo/removal of pavement.

Wetlands Protection Act, MGL Ch.131 S.40

Eight Public Interests:

- to protect the private or public water supply
- to protect the ground water
- to provide flood control
- to prevent storm damage
- to prevent pollution
- to protect land containing shellfish
- to protect wildlife habitat
- to protect the fisheries

Dams impair these public interests.

Most existing dams could not be built under current regulations.

Chapter 91 - Waterways Act

Purpose: Protect public rights of access and navigation in and along tidelands, rivers and streams, and Great Ponds.

All fill, structures, or dredging in these resources requires a license or permit from MassDEP (exceptions at 310 CMR 9.05(3))

DEP has the authority to revoke licenses and allow or order the removal of structures no longer in use

See MGL Ch. 91 S.12A and *310 9.05(3)(k) removal of fill or structures in accordance with the provisions of 310 CMR 9.08* [Enforcement] *or 310 CMR 9.27* [removal of previously licensed structures] *and 9.05(3)(m)* [removal of unauthorized structures to support a water dependent use]

Goal: Restore and Reconnect

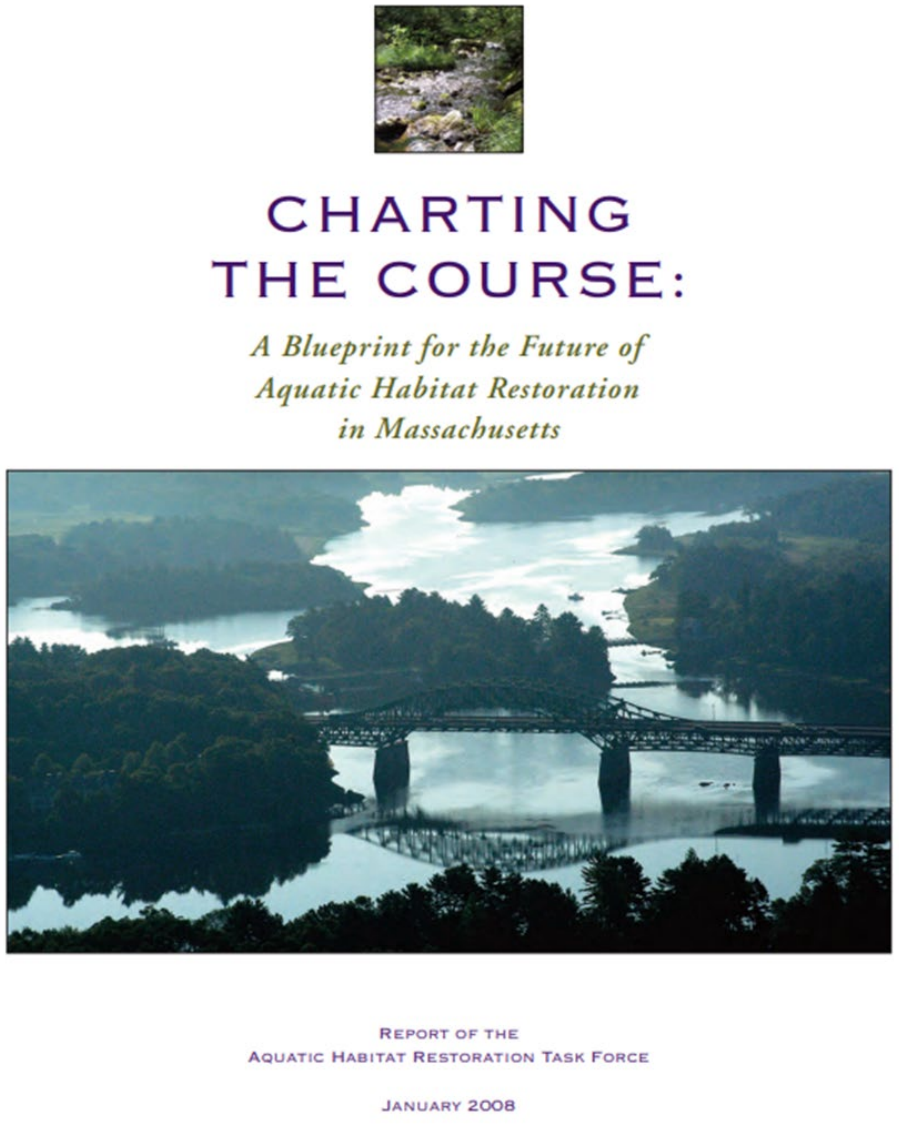
- Remove fill, water control structures
- Restore river processes and stream connectivity
- Restore fish and wildlife habitat
- Eliminate flood hazards from dam failures
- Restore and reconnect floodplains
- Restore bordering wetlands
- Improve public access and navigation

What if doing harm like this was not allowed?

- Dams that serve no purpose must be removed
- Abandoned cranberry bogs must responsibly decommissioned (i.e., close ditches, remove water controls)
- Salt marshes with collapsing platforms must have ditches healed and excess water drained

This would require **systems change**.

Reforms to Date: Incremental, Insufficient



- 2013 Wetlands Regs – Ecological Restoration Permits (ERPs)
- MassDEP Climate Resilience 1.0, 1.5 regs, salt marsh guidance

Need a Fresh Approach

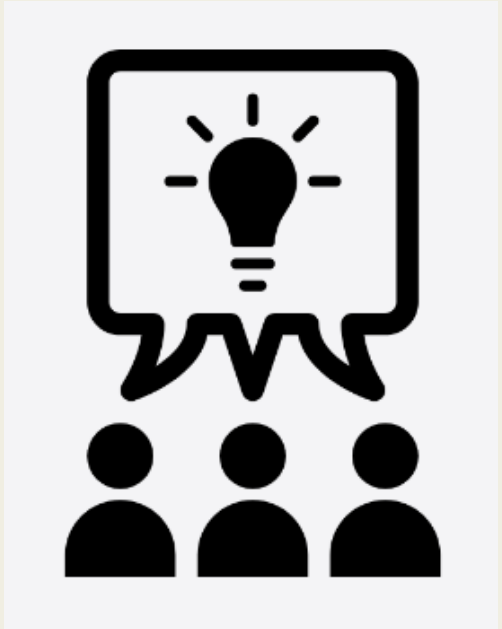
Other states are innovating - Massachusetts can too!

FUNDING NATURE, NOT PAPERWORK

Policy and Programmatic Pathways to Speed Restoration Permitting

ENVIRONMENTAL POLICY INNOVATION CENTER

Streamlined Permitting Database



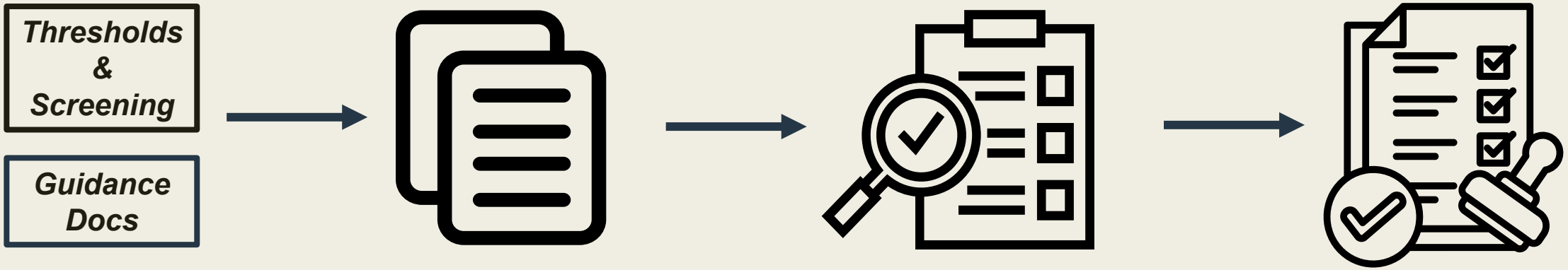
CALIFORNIA DEPARTMENT OF FISH & WILDLIFE

Cutting the Green Tape

Vision: “3 in 3” -- 3 Steps in 3 Months

Radically simplified permitting for Ecological Restoration Projects in Massachusetts

3 steps in 3 months



Mass Audubon

Heidi Ricci and Alex Hackman, Mass Audubon (and many partner organizations)
June 2024

Potential Streamlining Models

Single Agency Oversight (3 in 3 Model)

- Consolidate review: single application, one agency coordinates input from other agencies

General Permits/Exemptions/Notice Only Requirement

- For low risk, low impact work

Licensed Site Professionals Model

- Qualified Experts design and oversee projects - with permit exemptions or general permits

Watershed or Project Category-Based Permitting

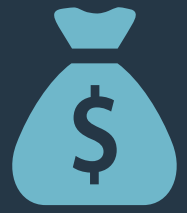
- Bundle projects based on a watershed restoration plan or standard technical guidance for categories of projects. Permit entire bundle under single permit annually.

Other Ideas?

Solution: Develop a Concrete Plan

- **Immediate Actions**
  - Establish vision and interagency process with external experts (federal, NGOs, consultants)
  - Ch.91 - eliminate licensing requirement if no (or positive) impact on navigation or public access
  - Finalize Dam Removal Sediment Management Guidance
  - Upcoming Wetlands Regulations comments (“Climate Resilience 1.5”)

- **Future Steps**
  - Combine and streamline permits
  - Comprehensive regulatory and/or statutory changes



Causing ongoing damage is hard because there are many incentives to stop

Addressing ongoing damage is easy because there are few barriers to begin

Conclusion

This is a time of big challenges that need big solutions.

How to do turn these headwinds into tailwinds?

www.massaudubon.org/advocacy

Sign up today!

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Resources

MassRivers Dam Busters

Environmental Policy Innovation Center
Funding Nature Not Paperwork
Streamlined Permitting Database

CLF and Mass Audubon Research Memo

Division of Ecological Restoration

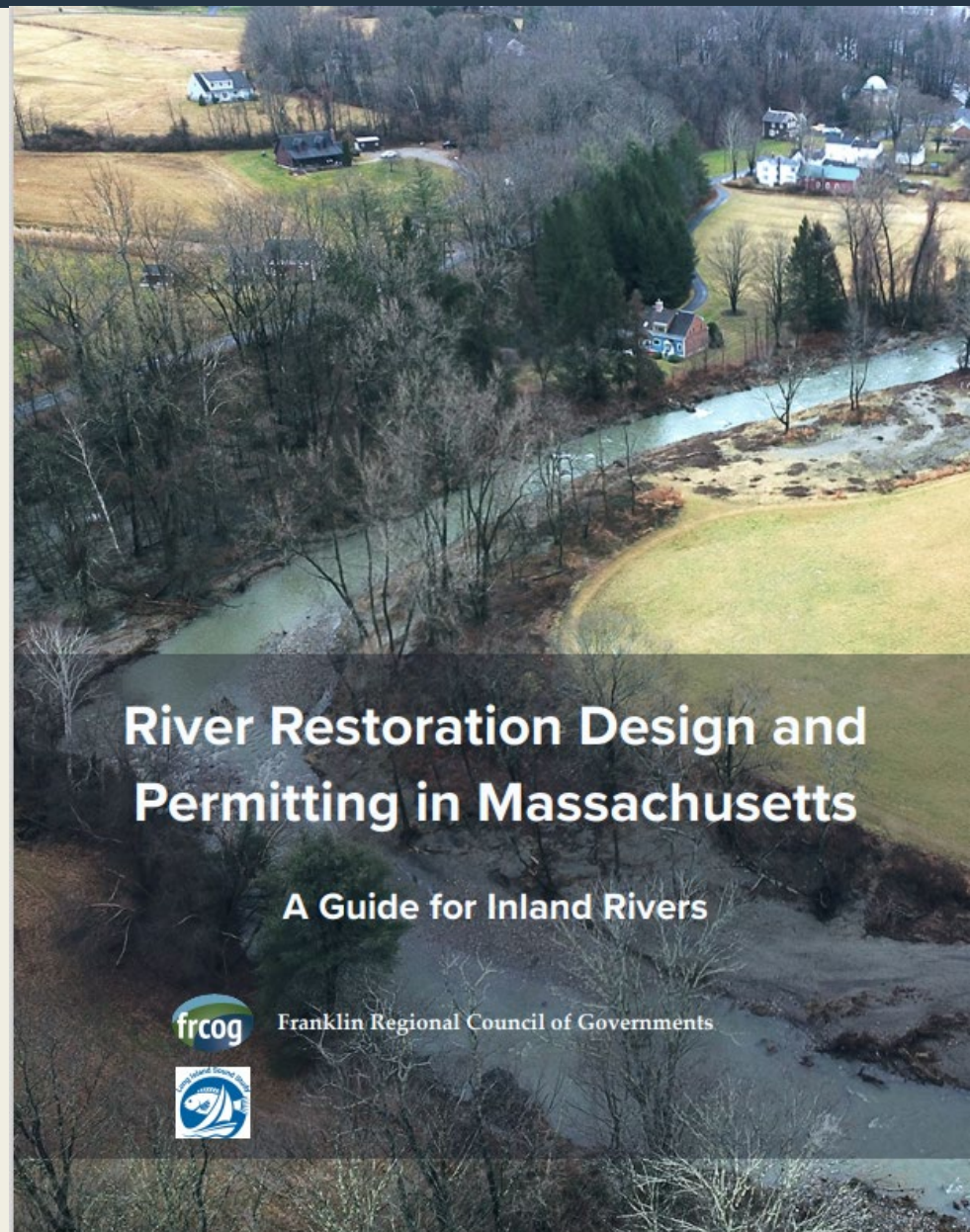
Municipal Vulnerability Preparedness (MVP)

resilient.mass.gov - funding sources spreadsheet

SNEP Network Buffer Restoration Guide
bufferrestorationguide.org

River Restoration Design and Permitting in Massachusetts: A Guide for Inland Rivers – FRCOG

American Rivers – Restoring Damaged Rivers



Southeast New England Program Network

Who We are

A geographic program of US EPA

The Network is **collaborative of 16+ local and regional experts** that provides FREE Training and Technical Assistance to build local capacity of SNEP communities and Tribes