ROYAL RIVER
YARMOUTH, MAINE
AQUATIC ECOSYSTEM RESTORATION STUDY

CONTINUING AUTHORITIES PROGRAM
SECTION 206

OCTOBER 09, 2024

New England District,
U.S. Army Corps of Engineers

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MEETING STRUCTURE

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- We will begin with a short presentation and then we will open the meeting for questions.
- Hold your questions until after the presentation.
- State your name and business/agency (if you are an official representative) before making a comment and speak clearly for recording to capture comment accurately.

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MEETING STRUCTURE

- Comments received verbally during the public meeting or in writing will be captured as part of the studies official record.
- We will do our best to address the questions asked tonight, but we may need to get back to you with additional information.
- Meeting is being recorded and will be transcribed for the record.

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RULES OF THE ROAD

- Be respectful of the other participants.
- Avoid disrespectful comments in the chat or when asking questions
- Refrain from using foul language.
- Turn your cameras off to save bandwidth.
- Please ensure your microphones are on mute.

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PROJECT DEVELOPMENT TEAM

Team Member	Title
T.J. Atwell *(Moderator)*	Public Affairs Office
Janet Cote *(Presenter)*	Project Manager & Planning
Donnie Faughnan *(Presenter)*	Environmental Resource Specialist
Marc Paiva *(In-person)*	Archeologist - Cultural Resources
Bill Mehr *(In-person)*	Realty Specialist
Matthew Fleming *(In-person)*	Engineer (GeoTechnical)
Paul Morelli *(Online)*	GIS/Mapping
Mike Andryuk *(Online)*	Engineer (Structural)
Kevin Hebard*(Online)*	Engineer (Civil)
Jenny Palacio *(Online)*	Economist
Chris Tilley *(Online)*	Engineer (Cost)
Thomas Mihlbachler	Civil Engineer (Civil – Hydraulics/Hydrology)

MEETING AGENDA

Meeting Goals

- Provide information about the Continuing Authorities Program study process.
- Provide an update on the Royal River study
- Describe the process the study team completed to develop the Tentatively Selected Plan (TSP)
- Present the Tentatively Selected Plan & environmental impacts of the plan.
- Provide information on the Public Review

Agenda

- Presentation
  - Continuing Authorities Program Overview
  - Study Scope
  - Fisheries of the Royal River
  - Tentatively Selected Plan (TSP)
  - Impacts of the TSP
  - What's next and what's left to do
  - The Public Review
- Questions & Answers

CONTINUING AUTHORITY PROGRAM (CAP)

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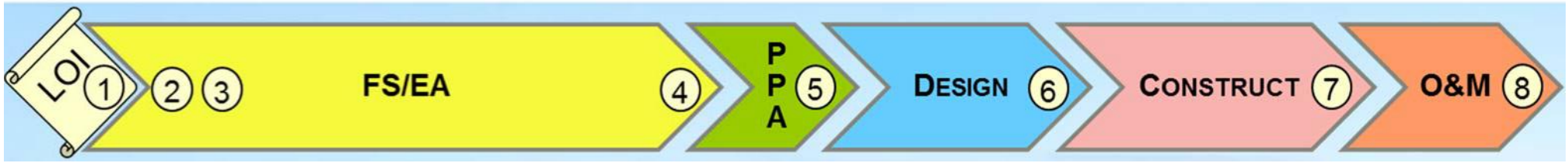
CONTINUING AUTHORITIES PROGRAM (CAP)

- CAP consists of nine legislative authorities to plan, design, and implement certain types of water resources projects without additional project specific congressional authorization.
- The Royal River, Yarmouth, ME project is authorized by Section 206 - focuses on aquatic ecosystem restoration projects that 1. improve the quality of the environment, 2. are in the public interest, and 3. are cost effective.
- CAP projects have two phases, a feasibility phase followed by a design and implementation phase.



1. Letter of Intent (from the nonfederal sponsor)

Feasibility Phase

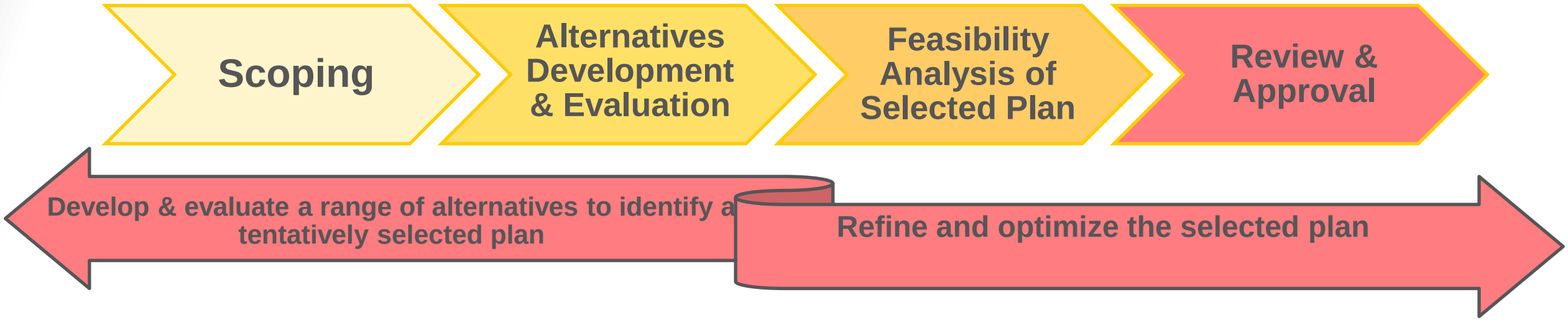
2. Federal Interest Determination
3. Feasibility Cost-Share Agreement (FCSA)
4. Feasibility Study/Environmental Assessment

Design & Implementation Phase

5 . Project Partnership Agreement (PPA)
6. Design
7. Construction
8. Operations & Maintenance

FEASIBILITY PHASE – WHAT IS IT?

Goal – To obtain develop a solution to a problem



- Must comply with Federal Laws (National Environmental Policy Act - NEPA)

Phase Completion - Once the final report/Environmental Assessment (EA) has been approved.

STUDY SCOPING

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STUDY LOCATION

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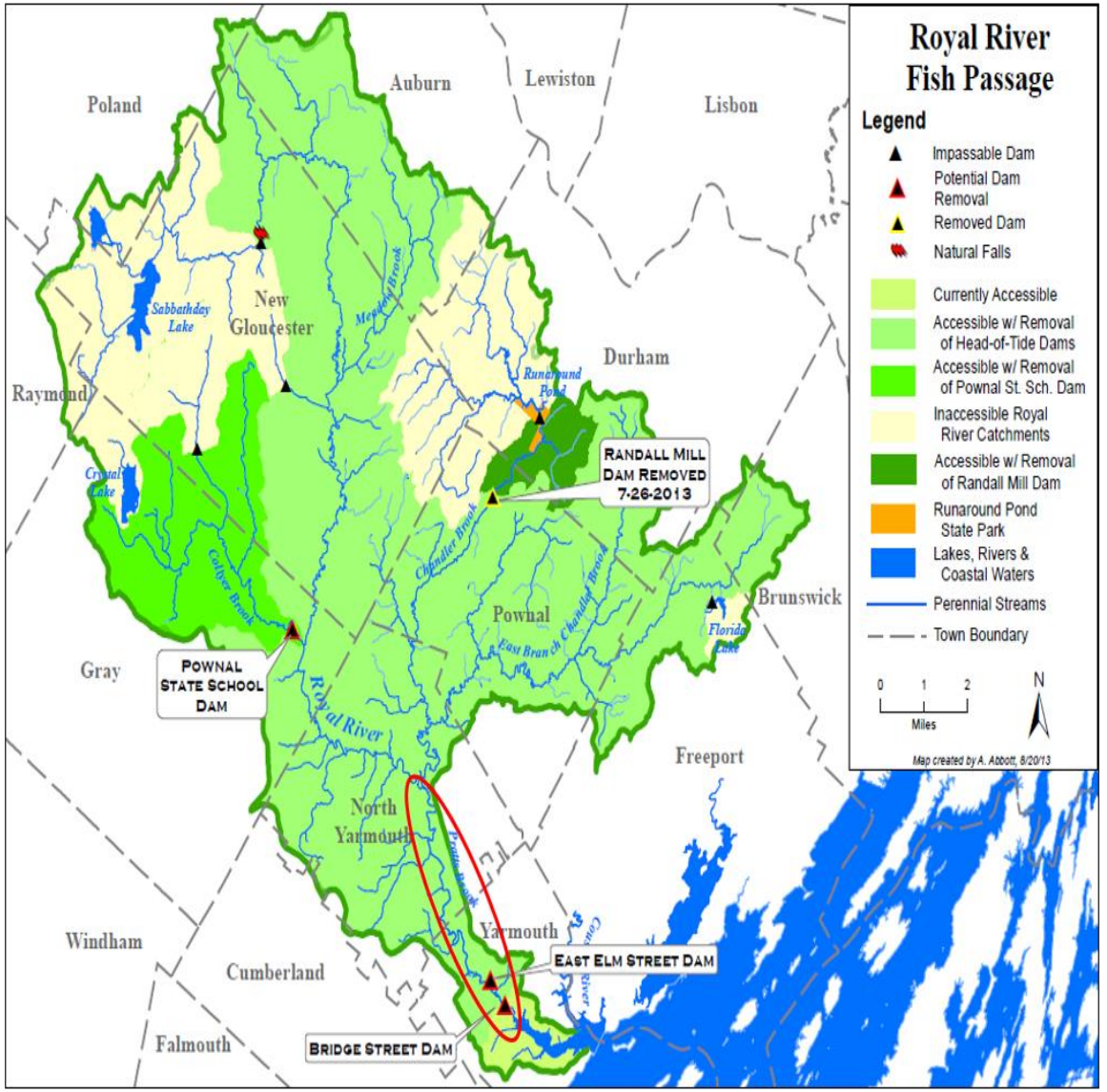
- Watershed is approximately 141 square miles – mixed use land
- Begins at the outlet of Sabbathday Lake in New Gloucester and flows 26 miles to Casco Bay in the town of Yarmouth
- Dammed beginning in 1674 to facilitate Industry (grain, paper, textiles, lumber, tanneries, poultry processing, and iron forging)
- By 1958, eight man-made dams spanning the river/tributaries.
- Randall Mill Dam – Removed 2013
- The 2 Dams in Yarmouth control 135 river miles of fish passage.

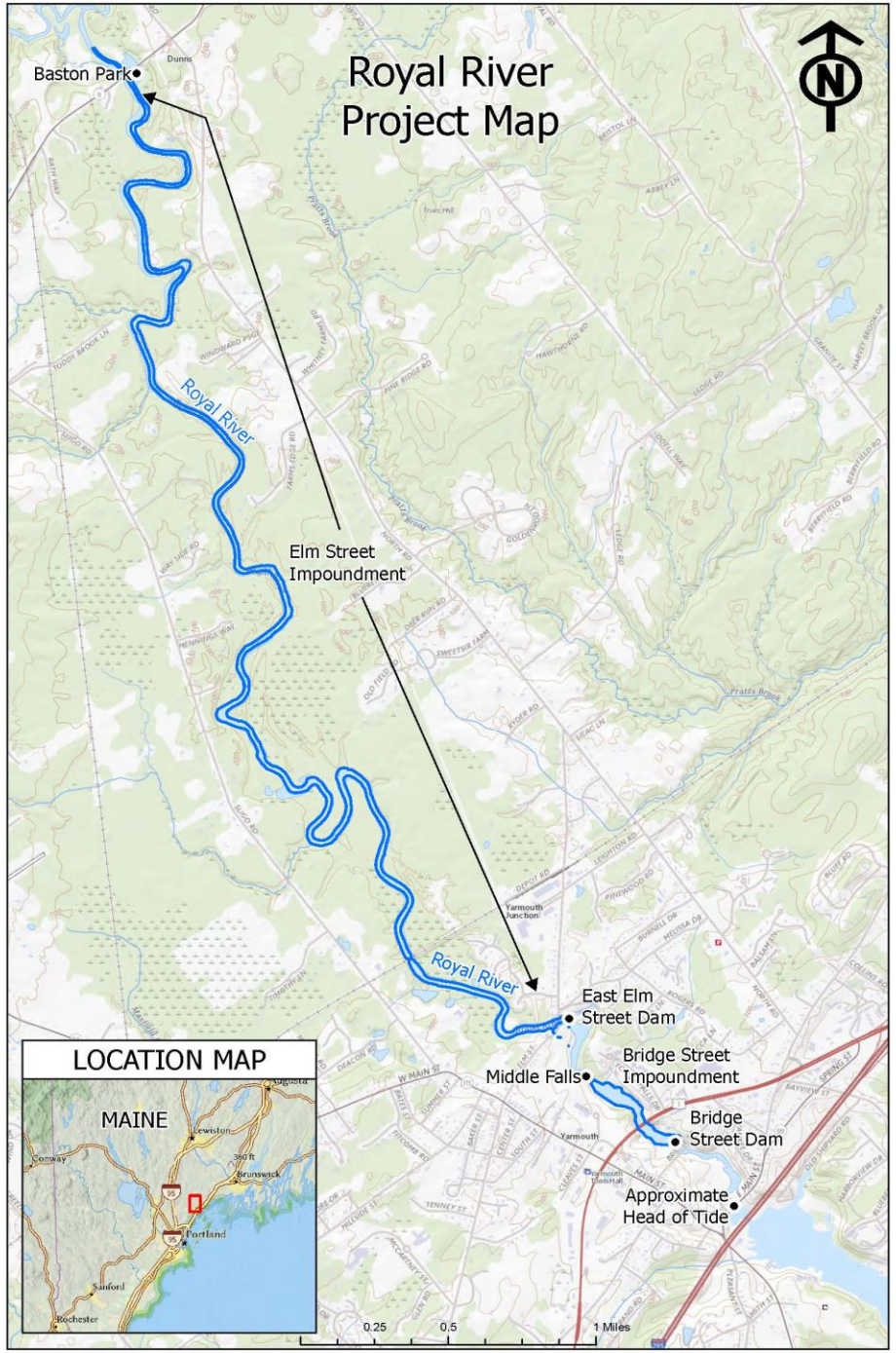


(Source: Gulf of Maine Coastal Program, U.S. Fish and Wildlife Service, 2013)

STUDY AREA

- Located the Town of Yarmouth/North Yarmouth
- From head-of-tide to Route 9/Baston Park, approximately 7.01 river miles.
- Includes most of the East Elm Street Dam Impoundment.
- Three barriers to fish passage.

1) Middle Falls (both man-made and natural)
2) Bridge Street Dam
3) East Elm Street Dam



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PROBLEM & OPPORTUNITIES

Problems

- Current dam and fish ladder configurations at Bridge Street and East Elm Street limits the upriver migration of listed and non-listed migratory fish species.
- The current configuration of Middle Falls partially or completely blocks fish passage.

Opportunities

- Improve the fish passage for migratory fish species.
- Increase connectivity within the Royal River.
- Restore riverine habitat with natural temperature and flow regimes
- Enhance the overall productivity of the Royal River ecosystem.
- Restore scenic falls and riffles
- Increase safety around the dam sites and reduce town liability
- Reduce O&M and replacement costs associated with the dams

FISHERIES OF THE ROYAL RIVER

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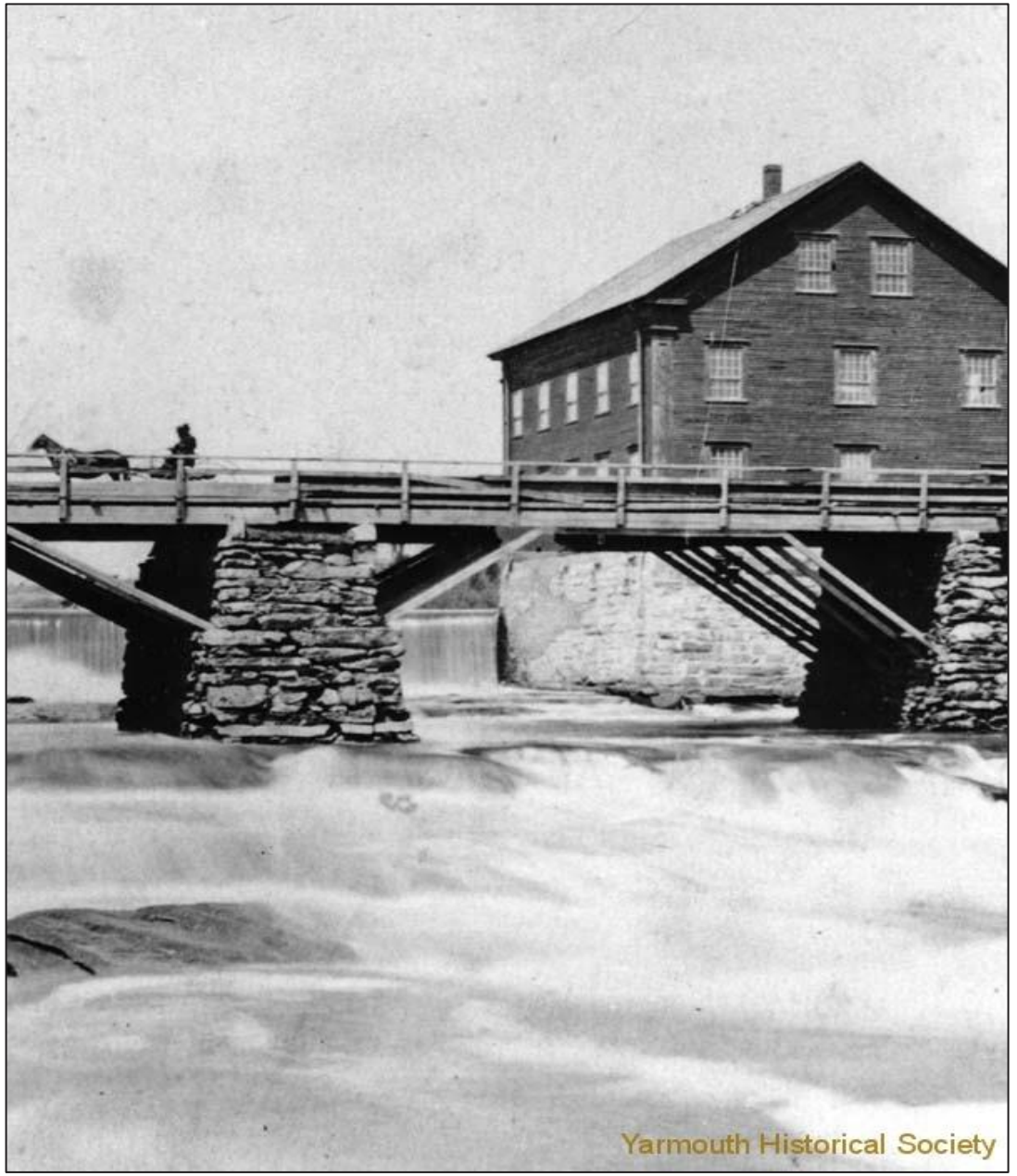
FISH PASSAGE OVERVIEW

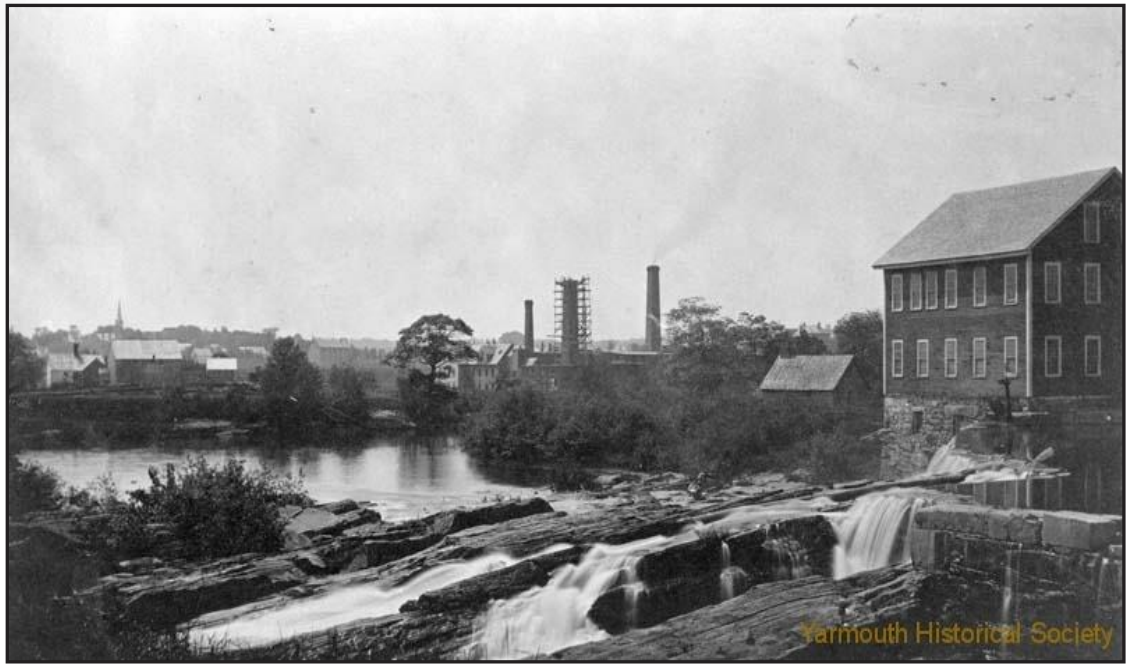
- History of Fish in the Royal River
- State of the Fishery
- Proposed Project Impacts to Fish
- Why Alewife?

HISTORIC FISHERIES DATA

- 1880s - There were small shad, alewife, and American eel fisheries on the river
- 1887 - the Royal River was noted to have had a large Atlantic salmon population in the early 1800s that had disappeared by the 1850s
- 1958 - Maine Inland Fisheries & Wildlife did not identify any salmon or other sea-run fish in the Royal River
- 1970's – Construction of Denil-type fishways at East Elm Street and Bridge Street Dam
- 1977 - Alewife stocked in Sabbathday Lake



HISTORIC FISHERIES DATA



Images of Yarmouth (yarmouthmehistory.org)

- 1978 - Adult American shad were stocked, and fall trapping indicated that juvenile shad were migrating downstream
- 1981, No adult shad were observed to be returning to the River. Alewife run was estimated at more than 50,000 ascending adults
- 1983, The alewife run decreased by half to 24,160
- 1988, Alewife run had decreased to 6,106 adults
- 2012, Town removal of granite blocks from Middle Falls Side channel
- Recently, Repair were made to the fish ladders and video evidence that some fish are moving through the structures.

STATE OF THE FISHERY

Common Name	Scientific Name
Brown trout	*Salmo trutta*
Brook trout	*Salvelinus fontinalis*
Yellow perch	*Perca flavescens*
Chain pickerel	*Esox niger*
Smallmouth bass	*Micropterus dolomieu*
Largemouth bass	Micropterus salmoides
Golden shiner	*Notemigonus crysoleucas*
Common shiner	*Luxilus cornutus*
Northern redbelly dace	*Chrosomus eos*
Blacknose dace	*Rhinichthys atratulus*
Creek chub	*Semotilus atromaculatus*
Lake chub	*Couesius plumbeus*
Fallfish	*Semotilus corporalis*
Nine-spine stickleback	*Pungitius pungitius*
White sucker	*Catostomus commersonii*
Brown bullhead	*Ameiurus nebulosus*
Pumpkinseed sunfish	*Lepomis gibbosus*

PROPOSED PROJECT IMPACTS TO FISH

Common Name	Scientific Name
Brown trout	*Salmo trutta*
Brook trout	*Salvelinus fontinalis*
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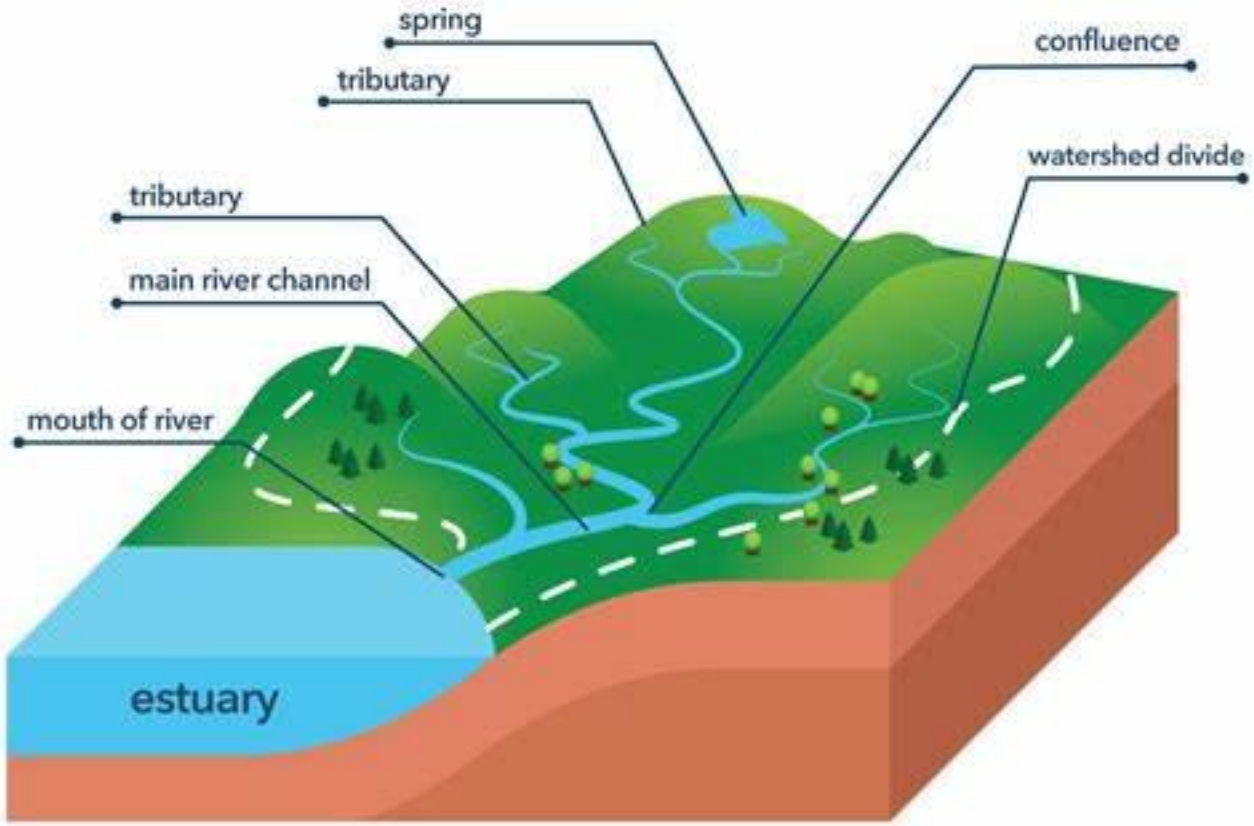
WHY ALEWIFE?

https://th.bing.com/th/id/OIP.bXo0xKThyk3as6R0olOmOQHaDo?rs=1&pid=ImgDetMain

WHY ALEWIFE?

- Anadromous Fish - those that **spawn in freshwater**, **migrate to the ocean** to forage and mature, and **return to freshwater to spawn** and begin the cycle again.
- Rivers flow **one way**, carrying resources and nutrients from the land out to the ocean.
- Anadromous fish are an annual return of resources from the ocean to upland streams, rivers and lakes
- Alewife, their eggs and their young are a food source for many native and recreationally important species



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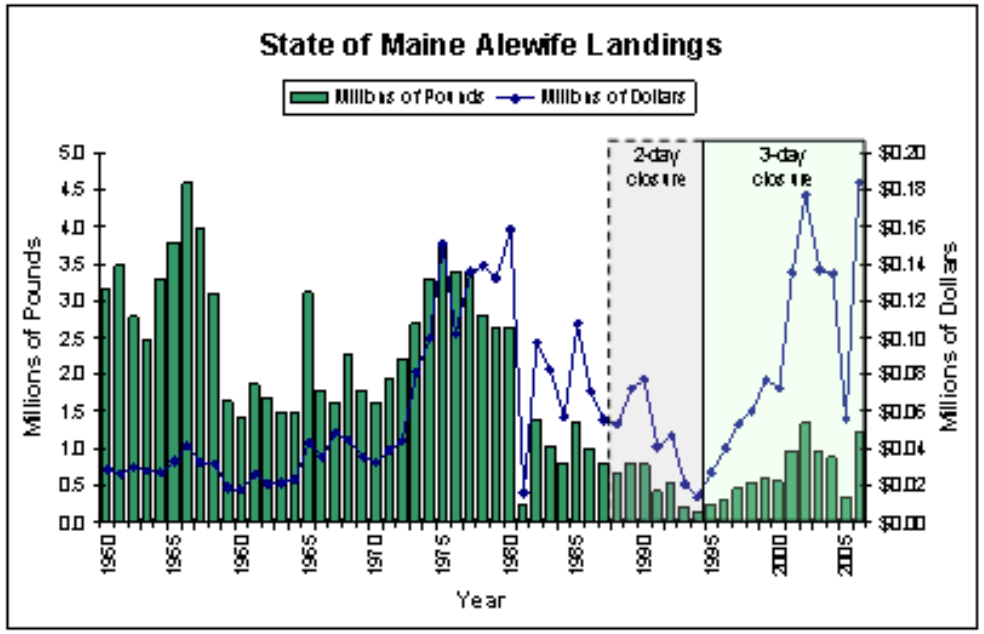
WHY ALEWIFE?



https://www.maine.gov/dmr/fisheries/sea-run-fisheries/programs-and-projects/river-herring-alewife-fact-sheet#:~:text=There%20are%2035%20Maine%20municipalities%20that

- Alewife historically occurred in all major and minor coastal watersheds in the state.
- Declines in these populations were caused by the construction of dams and heavy industrial pollution
- The most extensively distributed of the anadromous fish species in Maine

ALTERNATIVES EVALUATION

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MEASURES TO ADDRESS THE PROBLEM

Plan must address the three sites that restrict fish passage. Developed measures at both dams and at Middle Falls to achieve the objectives of the study.

<u>Measures at the Dam Locations</u>

- Fish ladders Replacement (different designs and layouts)
- Fish Ladder Repair
- Dam removal (full and partial)
- Dam Modification/Notching

<u>Middle Falls</u>

- Side Channel Natural Fish Passage
- Fish Ladder Construction
- Main Channel Modification (stone removal)
- Diversion Structure to the Side Channel
- Side Channel Modification (stone removal)

SCREENING OF MEASURES

Considered past studies, constructability, cost, and would the measure address the objectives of the study.

Measures at the Dam Locations

- Fish ladders Replacement (different designs and layouts)
- ~~Fish Ladder Repair~~
- Dam removal (full and partial)
- ~~Dam Modification/Notching~~

Middle Falls

- ~~Side Channel Natural Fish Passage~~
- ~~Fish Ladder Construction~~
- ~~Main Channel Modification (stone removal)~~
- Diversion Structure to the Side Channel
- Side Channel Modification (stone removal)

ARRAY OF ALTERNATIVES

Alternative	East Elm Street Dam	Bridge Street Dam	Middle Falls
1	No Action	No Action	No Action
2	Dam/Fish Ladder Removal	Dam/Fish Ladder Removal	Diversion Structure
3	Dam/Fish Ladder Removal	Dam/Fish Ladder Removal	No Action
4	Fish Ladder Replacement	Fish Ladder Replacement	Diversion Structure
5	Fish Ladder Replacement	Fish Ladder Replacement	No Action
6	Fish Ladder Replacement	Dam/Fish Ladder Removal	Diversion Structure
7	Fish Ladder Replacement	Dam/Fish Ladder Removal	No Action
8	Dam/Fish Ladder Removal	Fish Ladder Replacement	Diversion Structure
9	Dam/Fish Ladder Removal	Fish Ladder Replacement	No Action
10	No Action	Dam/Fish Ladder Removal	Diversion Structure
11	No Action	Dam/Fish Ladder Removal	No Action
12	No Action	Fish Ladder Replacement	Diversion Structure
13	No Action	Fish Ladder Replacement	No Action
14	Dam/Fish Ladder Removal	No Action	Diversion Structure
15	Dam/Fish Ladder Removal	No Action	No Action
16	Fish Ladder Replacement	No Action	Diversion Structure
17	Fish Ladder Replacement	No Action	No Action
18	No Action	No Action	Diversion Structure

TENTATIVELY SELECTED PLAN

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CHOOSING THE PLAN

- Developed costs and benefits for each of the eighteen alternative plans.
- Benefits focused on fish passage effectiveness
- Indicator of the relative value of each alternative with respect to overall aquatic ecosystem health
- Assessed the cost effectiveness and efficiency of each plan.

TENTATIVELY SELECTED PLAN

- **Removal of the Bridge Street Dam & Fish Ladder**
  - *Removal of the entire fish ladder and*
  - *Removal of the entire dam* (275 ft)
- **Removal of the East Elm Street Dam & Fish Ladder**
  - *Removal of the entire fish ladder*
  - *120 LF of dam on the right descending bank.*
- **Construction of a Natural Bypass at Middle Falls**
  - *Install a diversion structure at the top of middle falls to increase flow to the side channel.*
  - *If needed, complete additional measures (rock chipping)*





CURRENT WORKING COST ESTIMATE

Action	Cost
Dam & Fish Ladder Demolition & Diversion Structure	$3,674,753
Cultural Resources Preservation	$476,445
Real Estate/ Right of Way/Right of Entry	$84,572
Planning, Engineering & Design	$1,175,603
Construction Management	$306,981
TOTAL PROJECT COSTS	**$5,718,354**

Project Cost Share	
Federal Share	$ 3,717,000
Non-Federal Share	$ 2,001,000

BENEFITS OF THE PLAN

- Increases connectivity providing unhindered upstream (and downstream) fish passage (131 river miles)
- Restore the currently impounded reaches of the Royal River to river habitat (>7 miles)
- Restore natural river cascades
- Will benefit migratory species in addition to other native species (white sucker, sea lamprey, brook trout)
- Elimination of millions of dollars in future O&M, repair and replacement
- Improved safety and reduction of liability for the Town.

SAMPLING AND ANALYSIS

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SEDIMENT INVESTIGATIONS

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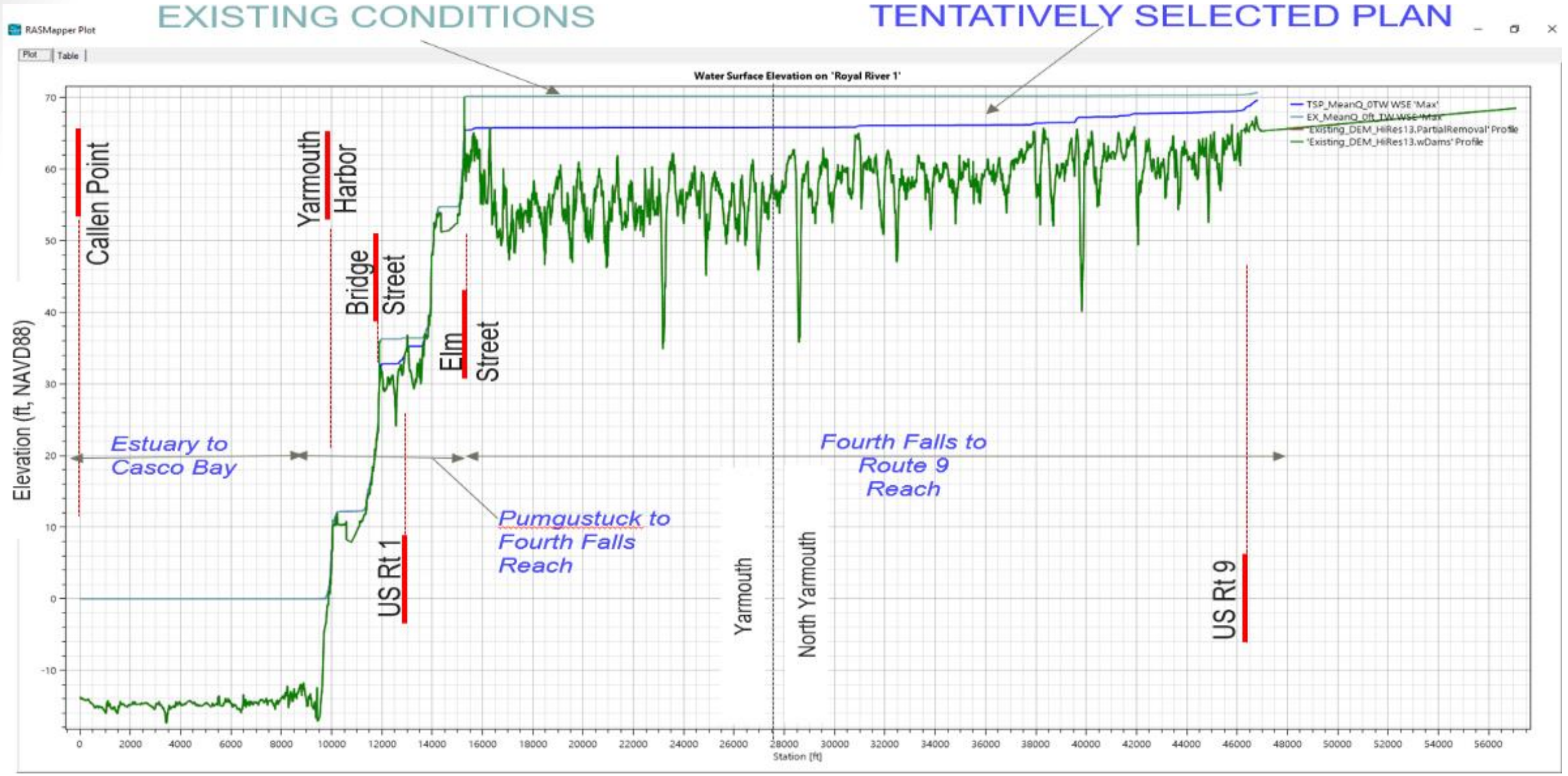
- October 2023 – Sediment Sampling and Testing
- November 2023 – ERDC WOTS Investigation
- December 2023 – Sediment Probing

Conclusions

- Riverbed is primarily scoured bedrock & coarse substrate with a fringe of fine sediment along portions of the bank.
- Majority of the sediments within channel profile appear to be highly mobile.
- No trace of the mercury contamination identified from previous sampling downstream of Bridge Street Dam.
- Bulk chemical concentrations documented in sediment from sampled areas were generally very low.
- Sediments pose minimal risk to the marine environment (Royal River estuary and Casco Bay) under the TSP.

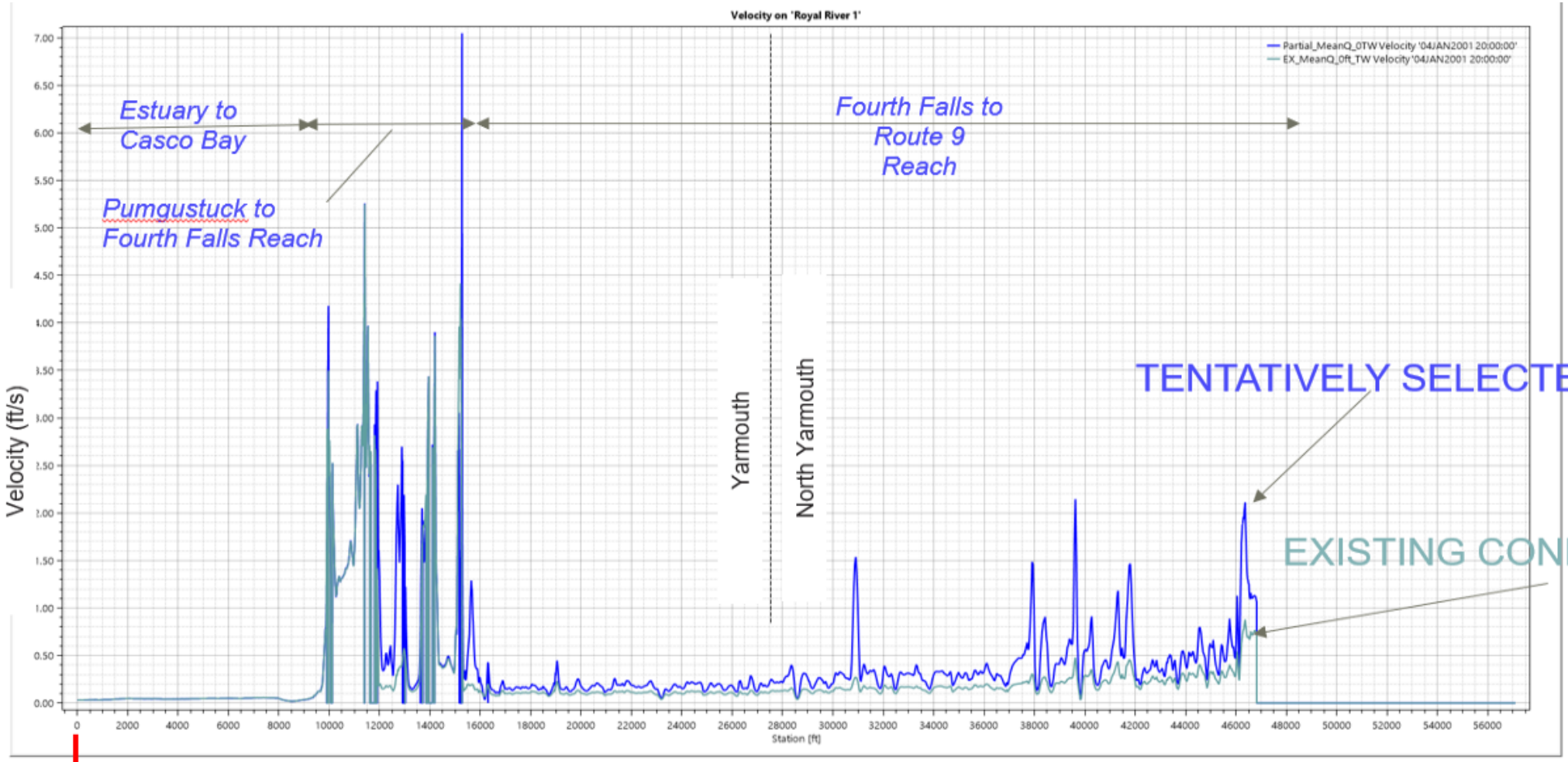
HYDRAULICS AND HYDROLOGY MODELING

RIVER DEPTH

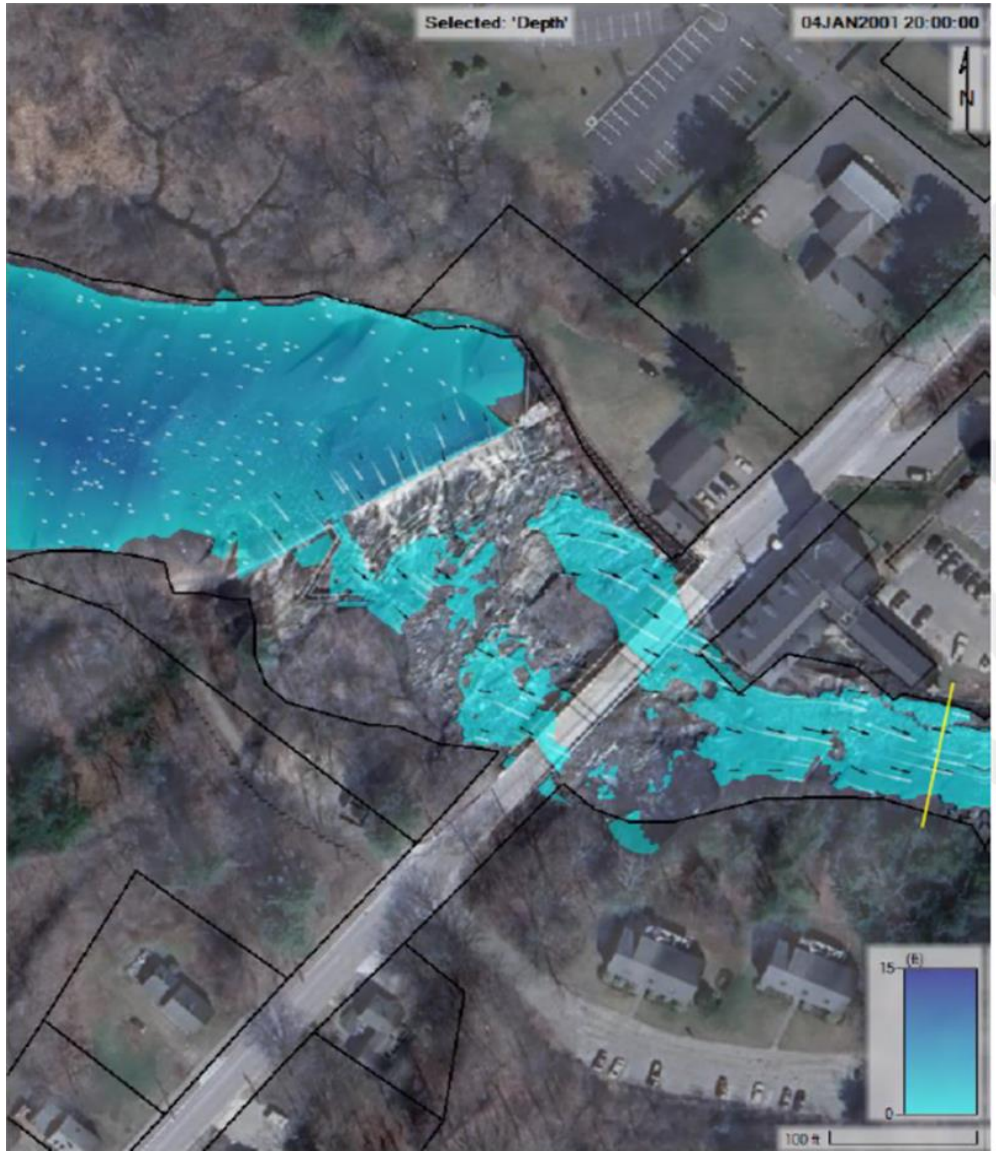


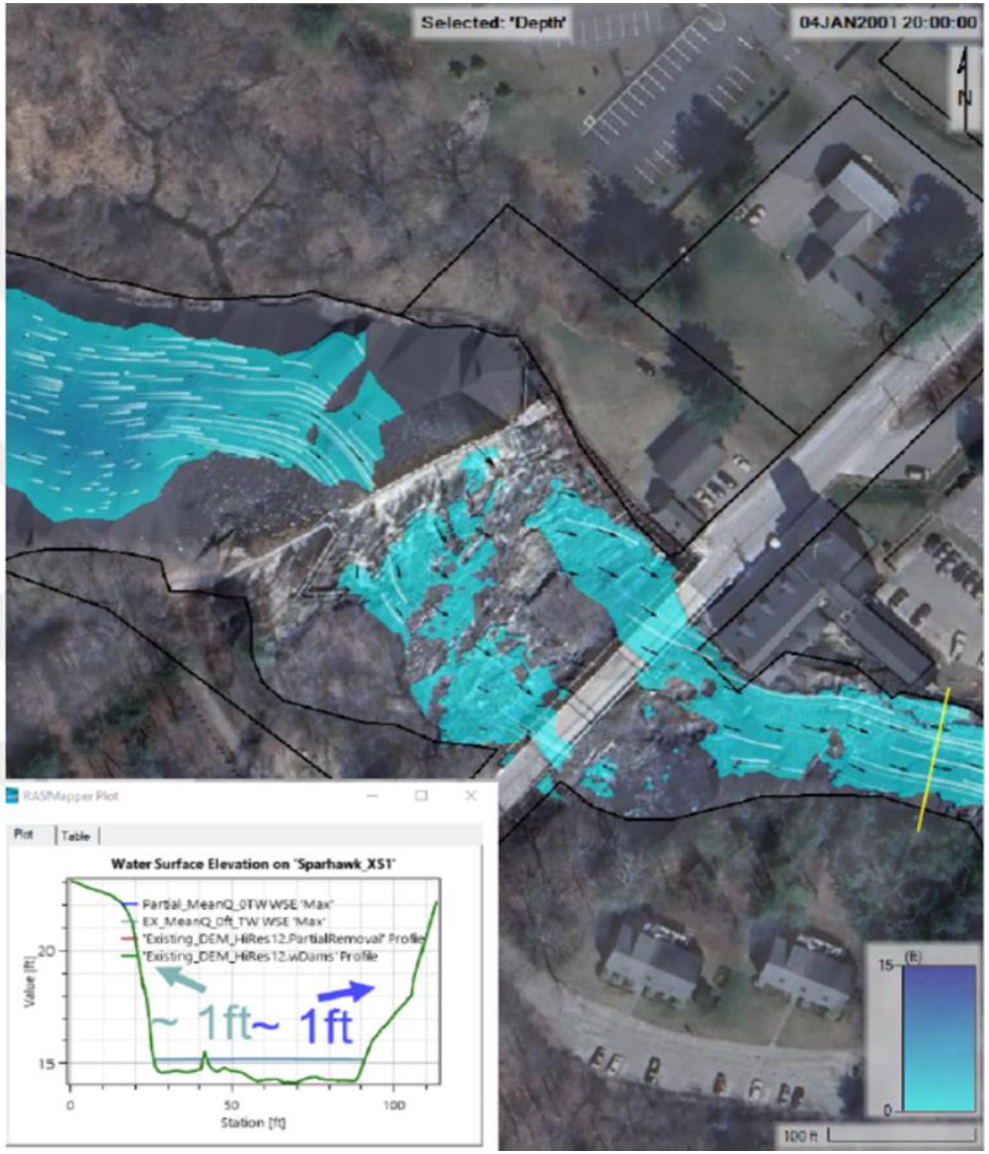
HYDRAULICS AND HYDROLOGY MODELING

WATER VELOCITY



HYDRAULICS AND HYDROLOGY MODELING





CLIMATE CHANGE CONSIDERATIONS

- The project will not affect climate change. But climate change may impact the fish species that are the beneficiaries of the project.

- Temperature will rise this century. Warmer year will mean earlier end of the egg-laying season (41-50 deg Fahrenheit range for water temperature). Expect 1 to 2-week shift.

- Expect earlier spring peak flows (April-May-June likely will have smaller flows on average).

- Sea-Level expected to rise:
  - Over 50 years by approx. 1 ft to 3 ft.
  - Over 100 years by approx. 3 ft to 8 ft.

IMPACT OF THE SELECTED PLAN

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ENVIRONMENTAL IMPACTS

No significant negative impacts. Long-term positive impacts

Resource	Impact
Recreational Opportunities	Fishing - Long-Term positive impacts Boating, swimming, winter sports - Long-term neutral minor impacts
Aesthetics	Long-term subjective impacts
Air Quality & Green House Gasses	Short-term negative impacts
Water Quality	Short-term negative impacts
Hydrologic & Hydraulic	Long-term neutral impacts
Floodplain & Wetlands	Floodplain - No impacts Wetlands - Long-term positive impacts
Cultural Resources	Long-term negative impacts
Fisheries	Long-term positive impacts
Wildlife	Short-term negative impacts, long-term positive impacts
Threatened & Endangered Species	No impact
Vegetation	Short-term negative impacts
Noise	Short-term negative impacts
Hazardous, Toxic & Radioactive Waste	No impacts
Socioeconomics	No impacts
Transportation & Infrastructure	No impacts
Occupational Health & Public Safety	Long-term impacts - safety concerns will change but not get worse.

* Short-term typically refers to the period of construction.

CULTURAL RESOURCES

- Impacts to historic properties are covered in the draft report and environmental assessment.
- A Programmatic Agreement will be developed in coordination with ME SHPO and interested parties in accordance with Section 106 of the National Historic Preservation Act and detail how historic and archaeological sites will be addressed during the next project phase prior to Construction.

PUBLIC REVIEW

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PUBLIC REVIEW

30-Day Review Period

15 OCT 2024---Begin public review of the study report, environmental assessment and technical appendices

15 NOV 2024---Public Review period ends

Documents

- Includes the main report (includes report and EA) and technical appendices.
- Available online on the webpage and 2 hardcopies will be available (Library and Town Hall).

Comments

- Provide comments either via email or by mail.
- Will become part of the public record.

PUBLIC REVIEW

Project Webpage – https://www.nae.usace.army.mil/missions/projects-topics/royal-river-aquatic-ecosystem-restoration-study/

Comment Submission

Via Mail

Attention Janet Cote
U.S. Army Corps of Engineers
New England District
696 Virginia Road
Concord, MA 01742

Via Email

RoyalRiverYarmouthME@usace.army.mil


WHAT'S NEXT?

NOV 2024---Address review comments and complete analysis

DEC 2024/Jan 2025---Finalize the study report & EA

APR 2025---Submit the study report & EA to Division for final review

MAY 2025---Receive final approval of the study report & EA

END OF FEASIBILITY PHASE

Design & Implementation Phase

5. Project Partnership Agreement (PPA)
6. Design
7. Construction
8. Operations & Maintenance

QUESTIONS

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