

**Gulf of Maine Council on the Marine Environment
CoastWise Tidal Road Crossing Concept Assessment**

December 9, 2014

Slade Moore, Biological Conservation



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CoastWise Road Crossings Assessment**

October 29, 2014

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Acknowledgements

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On the cover

The Thomaston Street tidal road crossing over Weskeag Marsh Creek, Rockland Maine, before (above) and after (below) installation of a bottomless culvert designed to accommodate anticipated flows and the movements of fish and wildlife.

Table of Contents

Introduction	1
Methods	1
Summary of Results	2
Conclusions	5
Appendix A	7

Introduction

Tidal wetlands provide a range of services including habitat for fish and wildlife, mediation of storm surge and coastal flooding and potentially high capacities of carbon sequestration. Among other factors, healthy tidal wetlands require unrestricted tidal flow in both directions. Field surveys in the Gulf of Maine (Return the Tides, USFWS unpublished data) demonstrate that road crossings over tidal streams are often undersized and elevated above the native streambed, which causes them to restrict flows and impair delivery of key services. Restrictive road crossings can also represent a liability and financial burden to municipalities due to increased maintenance costs, shortened lifespan of the structure and heightened risk to public welfare. Even when designed to meet current regulatory requirements, road crossings can result in impaired ecological processes as described above and may also lack resilience to sea level rise and other climate shifts that can impact the built environment.

Habitat restoration practitioners in some jurisdictions of the Gulf of Maine have developed successful outreach programs that encourage voluntary application of design principles for ecologically functional and resilient *non-tidal* road crossings over streams. Informal discussions among GOMC partners suggested the lack of a similar program specifically designed for *tidal* road crossings. The anticipated value of a tidal road crossing outreach program seemed high, especially if it could address the design guidance needs of road owners, local communities and those of coastal habitat restoration practitioners. Before any subsequent discussions, it was acknowledged that a more thorough assessment of need was required. To that end, the Gulf of Maine Association contracted with Biological Conservation to perform a rapid assessment of need and potential for developing a tidal road crossing initiative. During early discussions, the name “CoastWise” was assigned to the conceptual initiative. The name is provisional, but used in the remainder of this report for brevity and consistency.

Methods

Biological Conservation distributed questionnaires to representatives from each jurisdiction of the Gulf. Twenty-nine representatives were selected based on the assumption that they might have an interest in the concept and some knowledge of issues related to road crossings in the coastal environment. Maine’s representation (16 people) on the distribution list was disproportionately large as a result of that state being the home jurisdiction of the author and his familiarity with the network of practitioners working on a similar initiative (Stream-Smart) intended to improve non-tidal road crossing methods and practices. USGOMA helped the author by identifying potential representatives outside of the state of Maine. The numbers of questionnaires distributed to the remaining jurisdictions were: Massachusetts (seven), New Brunswick (one), New Hampshire (two), Nova Scotia (three) and the Canadian federal agency, Department of Fisheries and Oceans (two). The uneven allocation of questionnaires per jurisdiction was less than ideal, but considered acceptable. It should be noted that the initial point of contact receiving a questionnaire sometimes forwarded it to other parties they thought would better represent the issue of tidal road crossings in their jurisdiction.

The questionnaire featured 11 questions intended to provide the respondent’s insights into jurisdictional regulations, practices, perceptions and whether there seemed to be a need for, interest in, and resources available for developing a CoastWise initiative. Upon receiving completed questionnaires, responses from each jurisdiction were nested under corresponding questions in a single form provided as Appendix A. The Summary of Results attempts to provide a synopsis of the responses, reflecting prevailing trends in perceptions and preferences of the respondents. Readers are

encouraged to refer to the source “data” in Appendix A, as the process of translating respondent’s comments into condensed form was in no way scientific or infallible and may in some instances reflect the author’s biases.

Summary of Results

Numbers of completed questionnaires received from the jurisdictions were: Maine (four), Massachusetts (three), New Brunswick (one), New Hampshire (one), Nova Scotia (one), and Department of Fisheries and Oceans (one). NOAA employees stationed in Maine and Massachusetts were asked to frame their responses specifically within the context of conditions in those states, while Fisheries and Oceans responses were more broadly assigned to both Nova Scotia and New Brunswick. A brief synopsis of the responses is provided below for each question. Under any question, the lack of response from a given jurisdiction indicates that the jurisdiction provided no response.

1. Please name the legal mechanisms that regulate the construction, replacement, and maintenance of tidal road crossings on public and private roads in your jurisdiction.

In Maine tidal road crossings are regulated at the state level under the Natural Resources Protection Act. At the Federal level, tidal road crossings are regulated through the Clean Water Act and also the Endangered Species Act for that portion of the state falling within the Gulf of Maine Atlantic Salmon Distinct Population Segment. (Note: the author added some information).

New Brunswick, the NB Clean Water Act – Watercourse and Wetland Alteration Regulation 90-80 (WAWA Reg.) regulates road crossings.

In New Hampshire, RSA 482- A, The New Hampshire Fill And Dredge In Wetlands Act (the “Wetlands Act”) and Administrative Rules (ENV-Wt. 900) established standards for all crossings of perennial and intermittent streams, but not specifically tidal streams.

In Nova Scotia, the Nova Scotia Environment Act and possibly the NS Crown Lands Act are used to regulate stream crossings.

2. Please describe the most stringent regulatory *requirements* (not *recommendations*) in your jurisdiction as they pertain to the following design elements of road crossings over tidal streams:
 - a. Width of the road crossing structure (e.g. bridge, culvert, etc...) opening relative to the channel width in representative reaches/segments of the tidal creek/stream.
 - b. Cross sectional area of the crossing structure opening relative to upstream marsh acreage, if applicable to the site.
 - c. Cross sectional area of the crossing structure opening relative to upstream watershed area.
 - d. If a culvert with a bottom is permitted, considerations of the culvert bottom elevation relative to downstream and upstream elevation of the streambed.
 - e. Slope of the crossing structure.
 - f. Alignment of the crossing structure relative to the road alignment.
 - g. The crossing’s ability to accommodate unrestricted fish passage.
 - h. The crossing’s ability to accommodate unrestricted upstream flooding of tidal marsh.

- i. The crossing's ability to remain resilient to anticipated sea level rise or other climate-related factors during the design life of the structure.

Responses to this question sometimes appeared incomplete or contradictory. They suggested that to varying extent, each jurisdiction has at least some general requirements (regardless of tidal/non-tidal status) that address key road crossing design elements, such as crossing opening size, slope, and alignment, and provisions for the movements of aquatic organisms. Some jurisdictions also have formal or informal interagency project review practices that can benefit road crossing design. However, none of the jurisdictions reported regulations *requiring* comprehensive design elements specific to *tidal* environments. NH reported the potential for integrating tidal crossing requirements into their regulations and in at least one jurisdiction (NB), sea level rise is currently being considered during the design and review of Department of Transportation projects.

3. What is the level of public awareness in your jurisdiction's coastal communities of anticipated sea level rise and its influence on coastal flooding?

Responses indicated that in most jurisdictions awareness of sea level rise and its consequences was at least moderate and where flooding events or outreach occurred, or tidal restoration projects were common, it was higher.

4. What is the level of public awareness in your jurisdiction's coastal communities of the range of benefits associated with road crossings that are less apt to restrict the tides?

Responses indicated that awareness of tidal restrictions and benefits of improved crossing practices was limited with the possible exception of jurisdictions or portions of jurisdictions where tidal restrictions have been corrected and where few remain.

5. Do you think a non-regulatory outreach initiative that promotes improvements in the way tidal crossings perform would deliver meaningful results in your jurisdiction?

Each jurisdiction responded in the affirmative to this question, with additional comments that successful programs like Maine's Stream Smart initiative are models for delivering outreach to communities and practitioners alike. In Massachusetts, where much tidal restoration has occurred, one respondent recommended basing tidal crossing principles on assessments of the many completed tidal crossing projects in the GOM. Other responses advocated for technical guidance that could be applied to initiatives targeting discrete regions and possibly incorporated into regulation.

6. If [you answered "yes" to #5], please place an "X" after the type/s of outreach examples listed below that you think might best raise awareness in the near term (2014-2015). [Author's note: "2014-2015" was a typo in the questionnaire and should have read "2015-2016"]

Forum types recommended by each jurisdiction are indicated below by assigning state, provincial, and federal (CA) abbreviation codes. "CA Fed" corresponds to comments from the Fisheries and Oceans respondent whose comments addressed both Canadian provinces in the GOM. Based on the responses, all but possibly the white paper option seemed to generate more than passing interest as potential near-term outreach products. Comments by some respondents suggested a regional

approach for outreach and one that provides “rules of thumb” or principles based on assessments of previous tidal projects.

- a. Pamphlet: CA Fed, MA, ME, ME, ME, NH,
- b. Pocket-sized handbook: CA, MA, MA, ME, ME
- c. Website: CA Fed, MA, ME, ME, ME, NB
- d. White paper MA (possibly), ME, NH, NS
- e. Training for communities MA, MA, MA, ME, ME, ME, NB
- f. Training for engineers: CA Fed, MA, MA, ME, ME, ME, NH, NB, NS
- g. Training for costal resource management/restoration practitioners MA, MA, ME, ME, NB, NH, NS
- h. Other (please describe)

7. What are the most likely avenues for funding the outreach type/s you suggested in #6, above?

Potential funding sources named included “GOMC partnering organizations”, NOAA (including Coastal Services Center and Section 309 of the CZMA), National Estuarine Reserve system, USFWS, FHWA, and the Environmental Trust Fund (for NB).

8. If a CoastWise road crossing initiative experiences further development, would you like to be included?

All respondents registered their interest in being included in further CoastWise developments.

9. Do you have any suggestions for other people in your jurisdiction whose experience and interests would benefit a CoastWise initiative? If so, please provide names, phone numbers, and email addresses.

Please refer to Appendix A for other potential participants named by respondents.

10. Which of the following examples would provide the best forum to explore “next steps” for a CoastWise initiative? Place an “X” after the options you like best.

Forum types recommended by each jurisdiction are indicted below by assigning state, provincial, and federal (CA Fed) abbreviation codes. A stand-alone GOMC work session seemed to be the preferred venue for a “next steps” or scoping meeting, with a session at an upcoming conference or sessions within individual jurisdictions also generating interest. There was little interest in a work session as part of a GOMC meeting. One response articulated the need to determine if there is a core group who could provide the tidal restoration data necessary for an assessment on which the CoastWise principles could be based. Another response indicated that the need for funding to support this type of initiative should be fully acknowledged.

- a. Work session as part of a Gulf of Maine Council meeting: ME, ME
- b. GOMC work session as part of an upcoming regional coastal/natural resource conference: CA Fed, MA, MA, ME
- c. Stand alone GOMC work session including all jurisdictions: MA, MA, ME, ME, NB, NH, NS
- d. Stand alone work session targeting just your jurisdiction: MA, ME, ME, NB

e. Other (please describe)

11. Do you have any questions or comments not likely to be addressed by the questions in this questionnaire or its format?

Some responses focused on the need to provide communities not only outreach on how to build/replace tidal crossings better, but also a clear understanding of how (improved tidal crossing practices benefits them, including financial benefits.

Included were suggestions that a simple set of CoastWise principles be developed based on outcomes of previous projects and that outreach focus not only on crossings, but also roads that are vulnerable to sea level rise.

The challenge associated with developing a set of simple rules of thumb or principles was also stressed, asserting that engaging professional engineers would be necessary to ensure the initiative's credibility.

Conclusions and Next Steps

Responses to the questionnaire described above provided the basis for a rapid assessment of jurisdictional need and interest in a CoastWise tidal road crossing initiative. One important caveat should be mentioned, namely that most of the respondents were solicited based primarily on their interest in GOMC-sponsored efforts to support coastal conservation and restoration. Comprehensive knowledge of regulatory requirements related to tidal stream crossings was not a prerequisite. As a result, the ability of responses to accurately provide specific regulatory answers to questions #1 and #2 seemed uncertain. However, those same responses seemed to suggest that none of the jurisdictions have regulations specifically geared toward applying the full suite of critical design elements (crossing size, elevation, slope, alignment, fish passage, sea level rise, etc.) that influence the ecological integrity and resiliency of tidal road crossings.

Conclusions

- None of the GOM jurisdictions appeared to have comprehensive regulations specifically tuned to the construction or replacement of road crossings in tidal environments by all ownership types.
- Public awareness of sea level rise consequences and the benefits of road crossings that provide improved tidal exchange is, on the whole, moderate except in locales and regions where the public's experience with coastal flooding, tidal restoration projects or coastal outreach programs is common.
- All jurisdictions could benefit from a CoastWise initiative that provides guidelines and principles for improved tidal road crossing design and the outreach to encourage application of those principles.
- Each jurisdiction showed an interest in one or more near-term outreach products, ranging from an informational brochure to training.

- Outreach could focus on a set of principles or rules of thumb for a given set of conditions at tidal sites.
- Outreach principles could be based on an assessment of data from tidal road projects completed and/or new engineering/modeling.
- Funding is critical for further developing a CoastWise concept, but specific avenues for funding were not provided by the respondents.
- The respondents were interested in participating in further discussions about a CoastWise initiative and provided a list of other potential participants.

Next Steps

- Validating the assertion that comprehensive regulations specific to tidal crossings are lacking might provide the most immediate “next step”. A single representative from each jurisdiction working with her/his relevant federal and state/provincial regulators could accomplish this with relatively minor effort.
- Most respondents seemed to prefer a stand-alone GOMC-coordinated work session as a vehicle for scoping the CoastWise concept. A key element of that work session could be to determine whether and how a CoastWise tidal road crossing initiative would integrate with planning for coastal hazards resiliency, sea level rise, marsh migration, and blue carbon sequestration.
- Likewise, during that work session or before, a core group of interested project partners could identify who has access to restoration project data that could support development of empirically based guidelines and principles for tidal road stream crossings.

APPENDIX A

Responses to the October 2014 CoastWise Questionnaire

The lack of comments by a given jurisdiction for a specific question reflects that the respondents from that jurisdiction did not respond to that question or indicated they did not have sufficient knowledge to respond.

1. Please name the legal mechanisms that regulate the construction, replacement, and maintenance of tidal road crossings on public and private roads in your jurisdiction.

Maine:

- NOAA consults on the Endangered Species Act for tidal projects (including road crossings) in the Gulf of Maine DPS for Atlantic salmon.
- DMR provides comments on fish passage at road crossings. Municipalities do not have to submit proposed plans to DMR for comment, but DMR may determine that a road crossing blocks fish passage, and in turn, cite the state law that requires unobstructed access for migratory species. This is rarely employed. State owned roads and any crossing under the jurisdiction of Maine DOT must be submitted to DMR for comment. Any comments by DMR must be considered by DOT and the construction plan must be revised as a result, or a compromise is reached if full fish passage cannot be achieved.

New Brunswick:

- NB Clean Water Act – Watercourse and Wetland Alteration Regulation 90-80 (WAWA Reg.)

New Hampshire:

- State Law: RSA 482- A, *The New Hampshire Fill And Dredge In Wetlands Act* (the “Wetlands Act”). The state’s wetland permitting program is the primary means of wetlands regulation in New Hampshire. In May 2010, DES promulgated *Administrative Rules (ENV-Wt. 900)*, which established standards for all crossings of perennial and intermittent streams. These rules revised the manner in which culverts and bridges are designed in New Hampshire. The purpose of this rule change was to ensure that stream crossing structures in N.H. are designed to accommodate flood flows, geomorphic processes and aquatic organism passage. ENV Wt-900 does not specifically address stream crossings affected by tidal hydrology because their complexity prevented development of standards at the time that ENV-WT 900 was promulgated.

Nova Scotia:

- NS Environment Act and NS Crown Lands Act (I’m trying to verify the latter with colleagues in NS Dept of Natural Resources and Fisheries and Oceans Canada (DFO) – Fisheries Act

2. Please describe the most stringent regulatory *requirements* (not *recommendations*) in your jurisdiction as they pertain to the following design elements of road crossings over tidal streams:

- a. Width of the road crossing structure (e.g. bridge, culvert, etc...) opening relative to the channel width in representative reaches/segments of the tidal creek/stream.

CA Fed: design for 1 in 100 year flood event.

New Brunswick: Minimum size, type, and placement standards applied through the WAWA Reg. All gov't dept's must use these as minimum standards. Presently, Sea-level rise projections are being considered where replacement/upgrading of road crossings is proposed by Dept of Transportation. Large willingness (recognition) to accommodate SL Rise.

Nova Scotia: Sizing only based on 100 year storm flows (i.e., the freshwater source rather than the tidal flow).

- b. Cross sectional area of the crossing structure opening relative to upstream marsh acreage, if applicable to the site.

CA Fed: Nothing.

New Brunswick: Cross section area is based on watershed size not wetland size, though where wetlands are impacted the WAWA Reg allows us to dictate appropriate structure.

Nova Scotia: No requirements specified.

- c. Cross sectional area of the crossing structure opening relative to upstream watershed area.

CA Fed: Design for 1 in a 100 year flood

New Brunswick: Same response as b.

Nova Scotia: Area/sizing to accommodate 100 year storm flow

- d. If a culvert with a bottom is permitted, considerations of the culvert bottom elevation relative to downstream and upstream elevation of the streambed.

New Brunswick: Required standards developed by Fisheries and Oceans Canada (Fed. Agency responsible for fish habitat) are made conditions of any approval through the WAWA Reg.

Nova Scotia: Culvert to be embedded a minimum of 0.2 x Diameter.

- e. Slope of the crossing structure.

CA Fed: Structure slope must meet stream bed slope . 0-.5% slope – culvert with no baffles. 0.5%-8% culvert with baffles. If stream fully floods during tide, baffles not an issue as diadromous fish will migrate with incoming tide.

New Brunswick: Same answer as d.

Nova Scotia: Less than or equal to 0.5%.

- f. Alignment of the crossing structure relative to the road alignment.

CA Fed: Recommended perpendicular – no diversion of streambed permitted.

New Brunswick: Same answer as a.

Nova Scotia: No requirement specified.

- g. The crossing's ability to accommodate unrestricted fish passage.

CA Fed: Fish passage required. Tidal culverts – fish passage not a large issue – ensure backflooding of inlet of culvert.

Maine: Fish passage must be accommodated, but often is not because of cited logistical problems including underground utility lines, cost, etc.

New Brunswick: Same answer as d.

Nova Scotia: DFO reviews and makes case-by-case decisions

- h. The crossing's ability to accommodate unrestricted upstream flooding of tidal marsh.

CA Fed: Design for 1 in a 100 year flood

New Brunswick: We only recently started asking Dept of Transportation to calculate this and this included as a condition of approval in the WAWA permit.

Nova Scotia: Sizing for 100 year freshwater storm events should accommodate most upstream flooding events.

- i. The crossing's ability to remain resilient to anticipated sea level rise or other climate-related factors during the design life of the structure.

CA Fed: Nothing.

New Brunswick: Though Dept of Transportation is thinking about this there is no formalized approach to estimate or assess crossing's vulnerability.

Nova Scotia: No requirement specified, other than capacity to accommodate the peak flow for a 100 year return period

Other:

CA Fed: There are NO guidelines for TIDAL culverts in NS. We do have guidelines for freshwater stream culverts (non-tidal). Design for 1 in a 100 year flood event.

Massachusetts: The State of Mass and Army Corps of Engineers Programmatic General Permit don't specifically address design elements related to tidal streams.

Maine: There are no standards for road crossings in tidal situations in Maine, as far as I know. For projects funded by the NOAA Restoration Center, we want to restore tidal flow and fish passage.

New Hampshire: To date, permitting of tidal stream crossings by DES has been on a case-by-case basis, which is consistent with approaches by other New England states. Under the existing regulatory framework set forth in 2010 stream crossing rules, applicants proposing construction of crossings in tidal habitat need to utilize Env-Wt. 904.09 Alternative Designs, because "installing the structure specified in the applicable rule is not practicable." In general, the "Wetlands Act" requires applicants to avoid, minimize, and mitigate impacts to jurisdictional resources, where practicable. The NHDES is currently implementing a process to update the rules of the Wetland Act. This may include new guidance on tidal crossings.

3. What is the level of public awareness in your jurisdiction's coastal communities of anticipated sea level rise and its influence on coastal flooding?

CA Fed: It is a recognized issue but often times not built into designs from the public.

Maine:

- Awareness is likely mixed. Coastal communities are aware of sea level rise, but don't necessarily understand how it applies to specific sites or whether there is design guidance.
- There has been minimal awareness or focus on this issue at the state-wide level.

Massachusetts:

- Good in Massachusetts, started with Tim Purington's work on the 90s and good in NH.
- Moderate.
- My communities are intimately aware of the issue, since many of them (i.e. Scituate, MA) are poster children for storm damage.

New Brunswick: I believe it is very high as there have been several flood events in the last 10 years and many extreme weather events that have impacted inland areas as well where coastal-type realities like flooding and erosion have been witnessed.

New Hampshire: Awareness of sea level rise and coastal flooding is relatively good thanks to the efforts of the NH Coastal Adaptation Workgroup (CAW), which is a collaboration of 19 organizations working to help communities in New Hampshire's Seacoast area prepare for the effects of extreme weather events and other effects of long term climate change. NHCAW provides communities with resources, education, facilitation and guidance.

Nova Scotia: Aware and increasing concern.

4. What is the level of public awareness in your jurisdiction's coastal communities of the range of benefits associated with road crossings that are less apt to restrict the tides?

CA Fed: Not sure?

Maine:

- I think it is probably generally limited to how well road crossings allow for fish passage.
- The awareness is likely low. My guess is that communities would be amenable to structures that restrict tidal flow (like tide gates or undersized culverts) if they limit upstream flooding, and don't recognize ecosystem benefits.
- At the statewide level, there has been little to no focus on constructing road crossings that are less apt to restrict the tides.

Massachusetts:

- Good in Massachusetts, started with Tim Purington's work on the 90s and good in NH.
- Relatively low.
- I think the towns are less aware of this issue, except in locations where they know flooding is already prone to occur. That said, many of the major road crossings and tidal restrictions have already been addressed via state and local restoration efforts.

New Brunswick: This is not well known / promoted and education campaign is probably needed.

New Hampshire: I would suspect that awareness of this issue is very low.

Nova Scotia: Limited to fair.

5. Do you think a non-regulatory outreach initiative that promotes improvements in the way tidal crossings perform would deliver meaningful results in your jurisdiction?

CA Fed: It would be useful.

Maine:

- Yes.
- Yes, an education campaign would be helpful.
- Yes. There does not seem to be movement at the statewide level to develop regulations that would make tidal stream/rover crossings more resilient or to design these crossings with maintaining natural tidal movement. Bringing this issue up at the town, regional, and non-regulatory level would raise awareness about this. We have had good success in Maine with the Stream-Smart program – I believe that the attention of people has already been focused to look at road crossings in a different way than simply placing a structure in the stream, and that rolling out a CoastWise program would be well received.

- Yes. Information that provides municipalities and stakeholders with the benefits of improved tidal crossing will promote awareness and improved crossing as a sustainable and worthy alternative to meeting minimum standards.

Massachusetts:

- Yes – but fewer opportunities exist in Mass and NH due to the work completed to date; need a fresh product; maybe something based on a post-construction assessment of completed restoration projects that yields a model or design element “targets”.
- I think it could be very helpful and would integrate well with work we are doing to both (1) inventory and assess non-tidal crossings and (2) assist coastal towns with coastal resiliency planning in the Great Marsh area of MA
- Yes.

New Hampshire:

In my opinion, the problem of tidal crossings isn’t necessarily awareness, but rather a lack of technical guidance that is incorporated into regulation; particularly with the lens of sea level rise. I think that regional guidance on the replacement of tidal stream crossings is where GOMC should focus its efforts. When it comes to awareness, I think it would be difficult to get attention from municipalities who may not have any upcoming needs for this information. Should GOMC choose to focus on awareness, the target audience should be natural resource professionals, regulators, and engineers.

New Brunswick:

Yes, a product that would highlight case studies that can be extrapolated / adopted by other coastal communities along a common shore (GoM/BoFundy or Northumberland Strait and coastal Mass-where similar issues exist) would be beneficial.

Nova Scotia:

YES – the Ecology Action Centre has done some outreach over the past decade but regulatory change has not taken place, except for wetland compensation/offset requirement to ensure no net loss of salt marsh

6. If so, please place an “X” after the type/s of outreach examples listed below that you think might best raise awareness in the near term (2014-2015). (Jurisdictional abbreviation codes used below)

- Pamphlet: CA, MA, ME, ME, ME, NH,
- Pocket-sized handbook: CA, MA, MA, ME, ME
- Website: CA, MA, ME, ME, ME, NB
- White paper MA (possibly), ME, NH, NS
- Training for communities MA, MA, MA, ME, ME, ME, NB
- Training for engineers: CA, MA, MA, ME, ME, ME, NH, NB, NS
- Training for costal resource management/restoration practitioners MA, MA, ME, ME, NB, NH, NS
- Other (please describe)

Maine:

It is suggested that such a website point to existing resources in lieu of “reinventing the wheel.” It is suggested that training for communities and engineers be integrated and performed on a regional and/or county basis. For example, Casco Bay is a region that would benefit from directed training.

Massachusetts:

Materials should focus on providing targets/rules of thumb based on analysis of before and after project data in the GOM.

7. What are the most likely avenues for funding the outreach type/s you suggested in #6, above?

CA Fed: No money available within Fisheries Protection Program, DFO.

Maine:

- I would think a combination of federal and non-federal grants.
- Develop Stream Smart training for tidal crossings in coastal communities.
- Not sure – possibly the same avenues as StreamSmart? I do not think state funding would come readily, although it would certainly be a good commitment on behalf of the natural resource agencies, and should be pursued.
- Federal funding is obvious (e.g., NOAA, USFWS, FHWA).

Massachusetts:

- Coastal services center? Estuarine Reserve program?
- State or federal restoration funding

New Brunswick:

In New Brunswick, the Environmental Trust Fund is available for such initiatives.

New Hampshire:

This needs federal level funding, perhaps through a coastal resiliency, emergency management, or restoration funding source. Perhaps Section 309 of CZMA. A portion of these federal funds are now let through a competitive process. A CZM program needs to be the applicant. Applicability of 309 funding for a tidal crossing initiative would depend upon the focus areas of the applicants’ 309 plan.

Nova Scotia:

GOMC request to provincial/state “partners”

8. If a CoastWise road crossing initiative experiences further development, would you like to be included?

CA Fed: Yes.

Maine:

- Yes.
- Yes.
- Yes, mainly to learn for myself what the best practices are so that I can use the information to comment on Maine DOT projects.

- Yes.

Massachusetts:

- Yes.
- Yes.
- Yes.

New Brunswick: Yes.

New Hampshire: Yes

Nova Scotia: Possibly, although other provincial gov't staff may be more relevant.

9. Do you have any suggestions for other people in your jurisdiction whose experience and interests would benefit a CoastWise initiative? If so, please provide names, phone numbers, and email addresses.

Maine:

- Pete Slovinsky, Judy Gates, Charlie Hebson, Kristin Wilson from the Wells Reserve, someone from NOAA and/or USFWS.
- Interested non-governmental organizations should include Maine Audubon and The Nature Conservancy. There are also groups that could be involved regionally (e.g., Sheepscot Valley Conservation Association, Kennebec Estuary Land Trust, Downeast Salmon Federation).
- Town of Warren, Town Manager: Elaine Clark. Email: manager@warrenmaine.org
- Town of Phippsburg, Town Manager: Mike Young. Email: phipps@phippsburg.com
- Town of Bristol, Town Manager: Kristine Poland. Email: kpoland@tidewater.net
- Friends of Merrymeeting Bay, Maine Coast Heritage Trust

Massachusetts:

- EPA, Mass bays, Watershed orgs (Parker R, Ipswich R...)
- Nancy Durfee, Scituate Coastal Resources Officer, (781) 783.2806, ndurfee@scituatema.gov; Brian Joyce, Cohasset Town Engineer, (781) 383-3094 ext 120, bjoyce@cohassetma.org; Joe Grady, Duxbury Conservation Agent, 781-934-1100 ext 5470, Conservation-Administrator@Town.Duxbury.MA.US; David Gould, Plymouth Director of Marine and Environmental Affairs, dgould@townhall.plymouth.ma.us , (508) 747-1620 ext 127

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Climate Change Secretariat – Darwin Curtis – 457 4844

10. Which of the following examples would provide the best forum to explore “next steps” for a CoastWise initiative? Place an “X” after the options you like best. (Jurisdictional abbreviation codes used below)
- Work session as part of a Gulf of Maine Council meeting: **ME, ME**
 - GOMC work session as part of an upcoming regional coastal/natural resource conference: **CA Fed, MA, MA, ME**
 - Stand alone GOMC work session including all jurisdictions: **MA, MA, ME, ME, NB, NH, NS**
 - Stand alone work session targeting just your jurisdiction: **MA, ME, ME, NB**
 - Other (please describe)

Massachusetts:

Determine first if there’s a core group interested in this initiative with access to the tidal crossing data and like the idea for a product (assessment, targets/rules of thumb brochure and outreach)

New Hampshire:

There is a lot of back-end work that is necessary to support an initiative like this. Adequate funding is necessary to bring capacity from start to finish.

11. Do you have any questions or comments not likely to be addressed by the questions in this questionnaire or its format?

Maine:

- The initiative needs to address why communities are not better served by putting in tidal restrictions (tide gates, undersized crossings) that restrict upstream flooding. Most communities will prioritize flooding over environmental concerns, and will also be very cost conscious.
- I believe that it is necessary to explore who the target audience would be for this message, e.g., municipalities? MaineDOT was asked to respond, and they are generally aware of relevant issues. My primary concern is related to municipalities that may replace existing tidal crossings. In addition, it is recommended that any training discuss potential benefits of improved tidal crossings as they related to sea level rise and sustainability. Money talks, and if it can be conveyed that spending a bit more money now will provide for improved sustainability of infrastructure down the road, then you win.

Massachusetts:

- Difficult to develop a single set of standards given all the variables (current and future low lying infrastructure, sea level rise, etc...), so maybe develop a few guidelines/targets/rules of thumb based on common scenarios (e.g. sites with no low lying infrastructure in the basin). Rules of thumb/targets might use upstream watershed size and tidal marsh acreage to provide recommended ranges of the structure’s orifice square footage. Use data from completed projects for an assessment that supports the design recommendations/rules of thumb, maybe with a model; probably 50 projects we can draw from, using before and after structural characteristics of the crossing and also tidal elevation data up and downstream.

- One issue to consider in addition to road crossings would be identifying roads that will be subject to flooding due to location and not necessarily to tidal culverts (i.e. adjacent to marshes)

New Hampshire:

This issue requires complex engineering and hydrology. I believe that paid engineering consultants are necessary to bring credibility to this initiative.