REQUEST FOR QUALIFICATIONS

FOR

SALT MARSH ENHANCEMENT DESIGN AND IMPLEMENTATION

August 1, 2025

Town of Cape Elizabeth, Maine
320 Ocean House Rd
Cape Elizabeth, Maine 04107

Released on August 1, 2025
Proposals due September 11, 2025

Section 1 Overview

The Town of Cape Elizabeth, Maine seeks proposals from professional consulting firms with expertise designing and implementing salt marsh surface hydrology enhancements to assist the Town with restoration of 31 acres of the Spurwink Marsh in Scarborough and Cape Elizabeth, Maine. The design will address oversaturation and subsidence due to historical agricultural modifications by establishing an appropriately sized single channel hydrology network within the marsh tidesheds. The salt marsh enhancement is part of a larger project to restore tidal flow to the upper Spurwink Marsh by removing Sawyer Road/Street, a project funded by the Maine Natural Resources Conservation Program (MNRCP). Enhancement methods shall meet the goals of the MNRCP workplan (Attachment A) and be consistent with best practices adopted by the United States Fish and Wildlife Service (USFWS).

Pre-existing data will be available to inform the design, including water level data collected in 2023 and 2024 in tidal channels and on the marsh surface, tidal marsh bird rapid demographic surveys and point counts, UAS imagery, baseline vegetation data, and historical documents. Addenda with available will be posted on the Town of Cape Elizabeth website. Additional data collected in 2025 will be provided to the hired firm when available.

Firms may submit on their own or as part of a team. The Town intends to award one (1) contract to complete the salt marsh enhancement design and implementation based on quality, range of expertise, and responsiveness of the packages received.

Section 2 Schedule

The following RFQ schedule will be used:

Release of RFQ	August 1, 2025
Deadline for written questions	September 2, 2025
Proposals due	September 11, 2025
Review of Proposals	September 15-September 22, 2025
Interviews for top qualifying firms, if needed	Week of September 29, 2025
Final Selection	October 8, 2025

Section 3 Scope of Work

Respondent will furnish all labor, materials and equipment necessary to perform the tasks as detailed below and in conformance with the project Workplan (Attachment A). Respondent must demonstrate a history of successful enhancement/restoration design in salt marshes.

1. <u>Mapping and interpretation of historic alterations</u>

   The hired firm will review existing marsh conditions to understand past alterations, including legacy agricultural modifications (e.g., ditching, embankments, etc.) that have

fragmented the marsh into artificial tidesheds with distinct drainage patterns and subsidence trajectories. These features will be mapped to help inform the drainage system that is appropriately sized while avoiding unintended activation of subsurface ditches, which can exacerbate vegetation loss and result in marsh collapse.

2. Marsh enhancement design and permitting

   The hired firm will develop a marsh enhancement design for 31 acres of salt marsh that creates a "single-channel hydrology network", appropriately sized to allow unrestricted tidal flow and eliminate surface water retention between high tides. Enhancement activities may include runnel creation, strategic ditch maintenance, and targeted ditch remediation to restore drainage and halt the expansion of mega-pools. Where feasible, small microtopography mounds may also be constructed to diversify habitat for saltmarsh sparrows and other wildlife.

   The hired firm will assist the Town's engineering consultant to complete required State and Federal permits. Tasks may include, but are not limited to, providing technical drawings and specifications for permit submissions, responding to regulators' questions about proposed designs, and assisting with post-implementation reporting including as built conditions and field modifications from approved designs.

3. Marsh enhancement implementation

   The hired firm will be responsible for implementing the marsh enhancement design according to permit requirements, including construction work windows. Due to the presence of State endangered saltmarsh sparrow, enhancement activities will occur outside of their nesting season (June – August). The anticipated timeframe for implementation is September through April. In addition, construction activity, when possible, generally will be restricted to neap tide cycles to reduce trampling and compression impacts. The hired firm must demonstrate a history of successful implementation of carrying out construction activities in salt marshes, including proactive steps to avoid compression of marsh soils or other long-term impacts, as well as experience with adaptive management stewardship.

4. Project Coordination

   The hired firm will provide the Town regular updates and submit monthly invoices. The hired firm will participate in the following meetings: project kick-off, 60% design, 90% design, pre-application, pre-implementation, mid- implementation, and post-implementation. Meetings associated with implementation will be in the field. Other meetings will accommodate a virtual format.

Section 4 Submission instructions

All qualifications packages are due and must be delivered to the Cape Elizabeth Town Hall, 320 Ocean House Rd, Cape Elizabeth, Maine on or before **September 11, 2025 by 2:00 p.m.** Proposals submitted late will not be considered or accepted.

Each respondent must submit two (2) paper copies of the qualifications package, plus an electronic version. One proposal fee package, which includes hourly rates of appropriate staff, shall be submitted under separate sealed envelope contained within the Respondent's sealed proposal. Submitted qualification packages must be clearly marked: **Request for Qualifications, Salt Marsh Enhancement Design and Implementation**

Qualification packages must be addressed and delivered to:

Maureen O'Meara, Town Planner
Town of Cape Elizabeth, Maine
Town Hall
320 Ocean House Rd
Cape Elizabeth, Maine 04107

Normal business hours are Monday, 7:30 am to 5:00 p.m., Tuesday-Thursday, 7:30 am to 4:30 pm. The Town will not be liable to any respondent for any unforeseen circumstances, delivery or postal delays. Postmarking on the due date will not substitute for receipt of the proposal. Each respondent is responsible for submission of their proposal.

A Proposal will be disqualified if the Hourly Rate Fee Proposal is not contained within a separate sealed envelope.

All questions must be in writing and submitted to Maureen O'Meara by September 1, 2025 at the following email address: maureen.omeara@capeelizabeth.org

Proposals are requested to be organized in the following manner:

1. Title Page: Include the proposal name, name of firm (lead firm if more than one firm is included in the proposal), local address, telephone number, name of primary point of contact, and date.

2. Table of Contents: Include a clear identification of the materials by section and page number.

3. Letter of Transmittal: Limit to two pages and briefly state the respondent's understanding of the work to be done, summary of respondent's project approach, and project timetable.

4. Personnel: Provide a brief summary of experience of individual(s) who will work with the Town of Cape Elizabeth. Include a list of recent relevant projects the individual(s) have worked on, with particular attention to work with the USFWS.

5. Project Approach: Detail how the firm will implement the scope of work. Include a summary of the technical, analytical, planning, and other relevant disciplines the firm will bring to the project, including registrations, licenses, and certifications, and identify how capabilities align with project tasks.

6. References: Provide a list of five (5) references of past clients, including primary contact's name, title, address, phone number, email address, and last project name and date that the respondent worked on with the reference contact.

7. Capacity Statement: Provide a statement confirming that the respondent can accommodate the anticipated workload within the proposed schedule, or a description of the schedule that the respondent can commit to accomplishing the project.

A fee proposal shall be submitted in a single separate sealed envelope with the proposal. Any proposal not complying with this requirement may be subject to disqualification. The available funding for saltmarsh enhancement design and implementation is $350,000. Final deliverables must be provided before receiving the full the project funding amount.

1. Fee proposal must include hours/hourly rate for all personnel/positions who will be assigned to this contract as well as travel time rates and mileage.

2. Fee proposal must include budget for miscellaneous fees and charges, such as postage, printing, etc.

3. Fee proposal may be adjusted after negotiations with the Town and prior to signing a formal contract, if necessary.

4. Fee proposal shall indicate the markup for subcontractor services.

Section 6 Evaluation Criteria

The Town of Cape Elizabeth will use a Qualifications-Based Selection (QBS) evaluation and selection process to secure professional services for this project. The Town will consider the following criteria to evaluate proposals:

1. Capabilities – based on information provided in section 4.5
   (40 points maximum)

2. Personnel experience and qualifications – based on information provided in section 4.4 (30 points maximum)

3. References – based on information provided in section 4.6 (20 points maximum)

4. Workload availability – based on information provided in section 4.7 (10 points maximum)

Fee proposals will be opened after the selection process has been completed.

Section 7 Selection Process

A Selection Committee consisting of the Cape Elizabeth Town Planner, Scarborough Sustainability Manager, WNERR Stewardship Director, and a representative of the USFWS will evaluate the submissions. Based upon an initial review, the Selection Committee may select, one, some, or all respondents for interviews. Should interviews be conducted, the consultant lead for the project must be present at the interview, and other key personnel may also be present.

Section 8 Standard Terms and Conditions

The Town of Cape Elizabeth reserves the right to amend this RFQ prior to the proposal due date. All amendments and additional information will be posted on the Town website: www.capeelizabeth.gov. The Town reserves the right to waive any information in proposals, to accept proposals or portions thereof, and to reject any and all proposals, should it be deemed in the best interest of the Town to do so. Nothing in this document shall require the Town to proceed with any of the identified services. The Town reserves the right to substantiate respondent's qualifications, capability to perform, and availability and past performance record.

The cost for developing the proposal is the sole responsibility of the respondent. All proposals submitted become the property of the Town.

The apparent successful respondent will be required to provide and sign a professional services contract. Prior to award, the apparent successful respondent may be required to enter into discussions with the Town to resolve any contractual differences. These discussions are to be finalized and all exceptions resolved within one (1) month of notification. If no resolution is reached, the proposal may be rejected, and discussions may be initiated with the alternative choice respondent. The Town may extend the one (1) month timeline if it is deemed appropriate.

The Town reserves the right to negotiate any additional work beyond the specified contract with the selected respondent. The Town reserves the right to cancel the contract if any key personnel change or additional are not agreed upon in writing.

The Town reserves the right to approve subcontractors. All work performed under contract to the Town becomes the property of the Town in the format specified by the Town.

A certificate of insurance is required from all consultants, contractors, and vendors doing business with the Town. Within two (2) weeks of the Notice of Award, respondent must submit a certificate of insurance name the Town of Cape Elizabeth as "additional insured." Failure to furnish the required certificate within the required timeframe may result in the proposal being rejected.

The successful respondent(s) shall agree to defend, indemnify, and hold the Town harmless from any and all claims, demands, suits, causes of action and judgments arising from or relating to consultant's performance, including claims of professional malpractice or negligence. Such indemnity shall include the Town's reasonable attorneys' fees as well.

The above referenced indemnity shall be in addition to and as a complement to the below described insurance coverage, which is a mandatory requirement of this RFQ and any award hereunder. The successful Respondents shall provide the following coverages at the recommended amounts; however, the Town is able to negotiate coverage amounts during the contracting process, if needed:

Commercial General Liability	$1,000,000.00
Automobile Liability	$1,000,000.00
Workers' Compensation	$1,000,000.00
Errors and Omissions	$2,000,000.00
Umbrella Coverage	$2,000,000.00

All policies shall be underwritten by companies licensed to sell insurance in Maine and that are rated A+ or better by AM Best Company. Self-insurance pools or trusts are not an acceptable substitute for the referenced commercial coverage.

Attachment A: MNRCP workplan

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2023-SM-Spurwink Marsh-Cape Elizabeth

Maine Natural Resource Conservation Pr

Restoration and Enhancement Work Plan
for
Sawyer Road/Street in the Spurwink Marsh

Maureen O'Meara, Planner, Cape Elizabeth
Jami Fitch, Sustainability Manager, Scarborough
Angela Blanchette, Town Engineer, Scarborough
Jacob Aman, Stewardship Director, Wells National Estuarine Research Reserve
Stephen Harding, Cape Elizabeth Town Engineer, Sebago Technics
Susan C. Adamowicz Ph.D., LMRD Biologist, U.S. Fish and Wildlife Service
Julia Kemnitz, Biologist. Fish and Wildlife Service
Bonnie Turek, Biologist, U.S. Fish and Wildlife Service

July 10, 2025

Acknowledgment:

This Restoration and Enhancement Work Plan has been modelled on the *MNRCP Little River Salt Marsh Restoration Work Plan (March 2023)*, prepared by Susan C. Adamowicz and Rachel Stearns, Rachel Carson National Wildlife Refuge, U.S. Fish and Wildlife Service.

A. General Project Information

MNRCP Project Name:	Spurwink Marsh Restoration/Road Removal
MNRCP ID	*Provided by MNRCP*
Location:	Scarborough and Cape Elizabeth, Maine
MNRCP Project Summary:	This project will restore 1.8 acres of exi salt marsh and enhance 31 acres of salt marsh habitat on the Spurwink River estuary in Scarborough and Cape Elizabeth, ME (Figure 1). Project goals include using restoration and enhancement techniques to restore hydrology and native vegetation by eliminating surface water ponding, rebuilding interior marsh elevation, establishing tidal wetland conditions and functions in restored areas, and enhancing potential saltmarsh sparrow nesting habitat. We will use enhancement techniques proven at National Wildlife Refuges (NWRs) and partner lands (e.g. MA Wildlife, Trustees of Reservations (MA)) including identifying restoring single channel hydrology to the marsh surface in order to increase plant growth, marsh elevation and accretion. Roadbed materials will be removed and the location regraded and planted with native salt marsh vegetation species.
Restoration Work Plan Title:	Sawyer Road Salt Marsh Restoration and Enhancement Work Plan
Plan Preparer:	Jacob Aman
Plan Date:	July 10, 2025
Permit Number(s), *if applicable**	NA at this time

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2023-SM-Spurwink Marsh-Cape Elizabeth

B. Current (Baseline) Condition

1. Site selection:

MNRCP projects are selected based on a competitive grant application process wherein applicants must demonstrate that projects meet standard review criteria. Each project is reviewed and assessed by the MNRCP Interagency Review Team (IRT) based on its ability to meet mitigation program goals such as the practicability of accomplishing ecologically self-sustaining aquatic resource restoration, establishment, enhancement, and/or preservation at the mitigation project site.

This site was chosen for enhancement and restoration due to both the significance of the salt marsh habitat and the urgency of public safety and infrastructure needs related to the culvert and road. Spurwink Marsh is identified as a priority for enhancing salt marsh habitat in the Atlantic Coast Joint

Venture Saltmarsh Restoration Priorities for the Saltmarsh Sparrow, Nelson's Sparrow, & Their Hybrids Maine, Version 2.1", and area road crossings are identified and vulnerable to coastal hazards in the Climate Ready Coast Southern Maine Resilience Plan. The communities conducted a feasibility study for improvements to the road and habitat and determined that managed retreat and habitat restoration were the preferred alternatives due to the high cost and potential environmental impacts associated with replacement of the road and culvert.

Project Description

The project will restore 1.8 acres of existing roadbed to tidal salt marsh and will enhance 31 acres of existing salt marsh habitat. Environmental assessments along with hydrologic and hydraulic modeling will be carried out to inform project design and establish baseline conditions for performance monitoring. Detailed restoration and enhancement designs will be developed in consultation with restoration experts, regulatory agencies, and MNRCP staff, which will make use of existing features, minimize adverse impacts, and maximize benefits to the habitat. Salt marsh enhancement techniques, primarily restoring single channel hydrology to the marsh platform, will increase marsh functioning and resilience to long-term changes in inundation from sea level rise. Enhancement of the 31 acres of salt marsh should precede road removal *in order to prepare the areas* to altered flows following road removal. The portions of Sawyer Street in Scarborough and Sawyer Road in Cape Elizabeth slated for removal will eliminate a tidal restriction that currently prevents full tidal flow from reaching upstream habitat. Project performance will be assessed following a detailed monitoring plan and protocols which are described in this Work Plan (see section N. Long Term Monitoring Plan). Additional modifications will be made as needed following an approved adaptive management plan if project performance benchmarks are not being met.

The 31 salt marsh enhancement acres are part of the USFWS Rachel Carson National Wildlife Refuge, while the road is within a narrow right of way owned by the towns of Scarborough (east of the tidal channel) and Cape Elizabeth (west of the tidal channel) (Figure 1). The project area is surrounded by over 600 acres of protected open space, both wetland and upland, including lands owned by USFWS, Cape Elizabeth Land Trust, Scarborough Land Trust, the Town of Cape Elizabeth, and the Town of Scarborough. In addition, each town has established resource protection zones surrounding the tidal wetlands, which in Cape Elizabeth exceeds the state minimum of the Highest Astronomical Tide (HAsT) elevation by starting at 3 feet above the HAsT elevation.

The existing roadway consists of a 0.25-mile-long paved roadbed, narrow shoulder, and associated 12' round corrugated metal pipe culvert where the road crosses the main tidal channel (Figure 2). In places the roadway is at, or slightly lower than, the Highest Annual Tide elevation, and periodically floods during Spring tide and storm conditions. The culvert is inspected annually by the Maine Department of Transportation and has been found to be in sub-standard condition, though it does not currently have a posted weight limit. There are no utilities associated with the road or crossing. The tidal channel is the boundary between the two towns, who share maintenance responsibilities for the culvert.

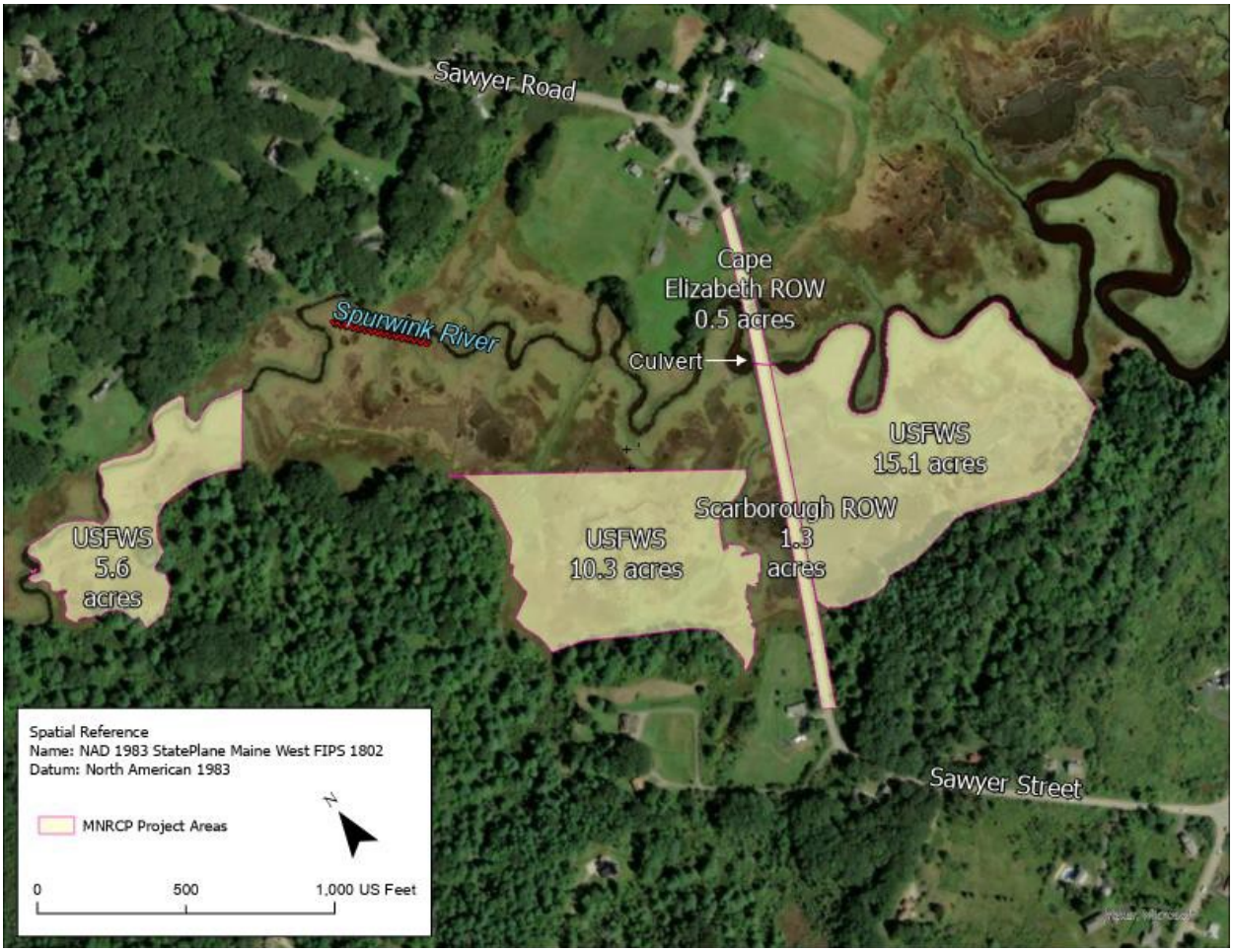

Figure 1. Ownership of parcels within the planned enhancement and restoration areas near Sawyer Rd/St.

The tidal channel is constricted at the culvert. Hydrologic and hydraulic modeling conducted by the towns have shown that the structure restricts tidal flow to the upstream tidal salt marsh and resulting higher velocities cause scour at the inlet and outlet of the crossing (McLean 2019). During extreme flood events, such as the back-to-back storms in January 2024, almost the entire road can become submerged, causing sheet flow across the road that creates erosive conditions and moves road materials into the adjacent salt marsh (Figure 3).

Figure 2. The tidal culvert under Sawyer St/Rd restricts tidal flow, as evidenced by the large scour pools and eroded marsh banks adjacent to the crossing (WNERR, 2024).

The Project is located within the Scarborough Marsh Focus Area of Statewide Ecological Significance. The Maine Department of Inland Fisheries and Wildlife's (MDIFW) Beginning with Habitat Program concludes "Given the wildlife productivity and habitat diversity in this area, Scarborough Marsh is arguably the most significant of Maine's coastal Focus Areas." (https://www.maine.gov/dacf/mnap/focusarea/scarborough_marsh_focus_area.pdf). A branch of the Spurwink River drains approximately 4.24 square miles of mostly undeveloped land upstream of the Sawyer Street/Road crossing, including agricultural fields, forest, and emergent freshwater and estuarine wetlands. The tidal marshes in this area are known to support a wide variety of wildlife, most notably the state endangered Saltmarsh Sparrow, and federally endangered Roseate Tern and threatened Red Knot. The Spurwink Marsh is identified as a priority marsh in the Saltmarsh Restoration Priorities for the Saltmarsh Sparrow, Nelson's Sparrow, & Their Hybrids by the Atlantic Coast Joint Venture (ACJV 2025).

Figure 3. Photographs of Sawyer Road flooding. Left, January 13, 2024 storm (WGME Channel 13); Right-top, December 23, 2022 storm (Matt Craig); Right-bottom, November 15, 2024 high tide (WNERR).

2. Impacted resource(s):

The impacted resources within the project area are Estuarine Intertidal Emergent Persistent Irregularly Flooded (E2EM1P) wetlands, with a small area of adjacent Palustrine Scrub Shrub Persistent and Emergent Seasonally Flooded (PSS1, PSS1/EM1R) wetlands, and small area of Estuarine and Marine Deepwater (E1UBL).

Historic impacts to these resources include the building of the roadbed (and tidal crossing), which filled approximately 1.8 acres of wetland and tidal channel, as well as historical agricultural alterations, including embankments and ditches originally installed to increase salt hay and crop yields. These farming management measures may date back several hundred years (Adamowicz et al. 2020) and have been partially documented through the use of aerial imagery, historic maps and photos (Figure 4).

As part of a secondary succession response to these disturbances, the marsh is undergoing a saturated subsidence trajectory which causes vegetation die-off, loss of elevation, and formation of large areas of shallow standing water (aka "megapools", see Figure 5). Additionally, the culvert and road embankment constrict the size of the channel relative to the natural channel downstream (Figure 2). This has led to high velocity flows that have created large scour pools at the outlet and inlet.

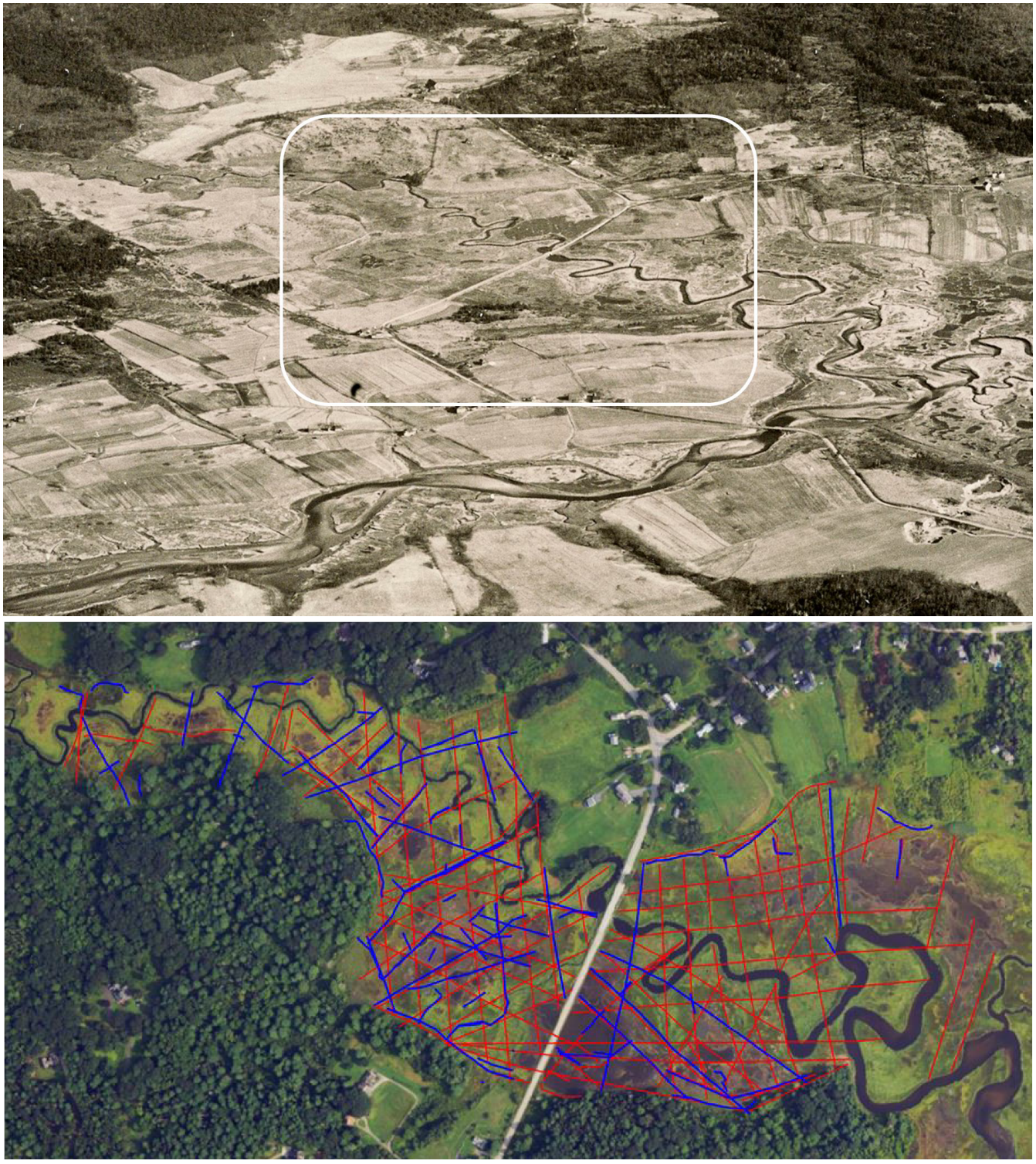

Figure 4. Top - Historical aerial imagery shows the extent of farming in the Spurwink Marsh near Sawyer Road/Street outlined in white (Portland Water District 1930). Bottom - Preliminary mapping of ditches (blue lines) and embankments (red lines) has been completed by USFWS and WNERR through analysis of aerial images (base imagery from ESRI, USDA).

Figure 5. Impacted resources within the MNRCP Project Site.

3. <u>Current wetland/resource functions and values on site:</u>

The Maine Natural Areas Program carried out a site assessment on August 29, 2023, and completed a summary report (Puryear 2023) which includes a table of the Ecological Functions and Values from the U.S. Army Corps of Engineers Highway Methodology Workbook Supplement (Table 1). The MNAP report concluded that:

> "It is expected that the proposed restoration both on the salt marsh platform and at the Sawyer Road tidal restriction will significantly improve and restore just about every associated wetland function and value associated with the marsh. However particular improvements will likely be recognized in the following: Floodflow alteration, Sediment/Toxicant Retention, Sediment/Shoreline Stabilization, and Wildlife Habitat. There is also significant opportunity for Educational/Scientific benefit from this project since it is easily accessible, is reliant on data driven design and expertise, and novel in its proposal for full road closure and removal."

Table 1. Current functions and values of the estuarine emergent wetlands on Spurwink Marsh, in Scarborough and Cape Elizabeth. Most of these have been degraded due to the dense network of agricultural ditches and berms as well as tidal restrictions from road crossings.

Ecological Functions & Values	Rationale*
Groundwater Recharge/Discharge	This section of the Spurwink Marsh functions as a groundwater discharge area and connects the estuary to the surrounding watershed.
Floodflow Alterations	High Value: Marsh system retains water during high tide events (recently marsh has flooded and overtopped road).
Fish and Shellfish Habitat	High Value: Provides important nursery and feeding ground for fish and provides shellfish habitat.
Sediment/Toxicant Retention	Dense vegetation and peat contribute to retention of sediment, and runoff with heavy metals and other pollutants.
Nutrient Removal	Vegetation is capable of nutrient removal, improving water quality, filtering runoff and removing nitrogen.
Production Export	Wildlife food sources present in mudflat, pools and marsh, conversion to higher trophic levels.
Sediment/Shoreline Stabilization	Vegetation trapping sediment but erosion and expanding pools present.
Wildlife Habitat	High Value: Extensive waterfowl use, Saltmarsh Sparrow nesting, fish and shellfish habitat, mapped Tidal Waterfowl and Wading Bird Habitat.
Recreation	High Value: Easily viewable from roadside, accessible for kayaking, part of National Wildlife Refuge property, birdwatching, photography, wildlife observation
Educational/Scientific Value	Opportunities for lessons in salt marsh ecology and restoration; easily accessible via road, parking. Close to community schools.
Uniqueness/Heritage	High Value: Part of a salt marsh and tidal estuary system; Saltmarsh Sparrow habitat; rare plant species present.
Endangered Species Habitat	Supports active breeding population of Saltmarsh Sparrow and Nelsons Sparrow (Maine State Endangered Species, Species of Concern).
Visual Quality/Aesthetics	Salt Marsh, Brackish Tidal Marsh.

*Principle functions and values are indicated as "High Value"

4. Reference site(s):

Since there are no salt marshes in a similar estuarine setting in southern Maine with sufficient ecological functioning to serve as a reference site (i.e., hydrologically unaltered and ecologically stable), a before-after-control-impact monitoring design will be used to determine changes resulting from site enhancement activities and whether we are attaining the performance standards given below (Table 4).

We will establish a control study site located on a nearby parcel of salt marsh owned by the Town of Cape Elizabeth (Figure 5). The control site is 12.2 acres in size, contains mega-pools and unvegetated areas of similar size as the enhancement areas, and is located far enough downstream of Sawyer Road that it is not expected to experience any changes in hydrology due to the removal of the road.

5. Existing wildlife use:

The project site is known to support several species of tidal marsh birds including Saltmarsh Sparrow (*Ammospiza caudacuta*, Maine State Endangered Species) and Nelson's Sparrow (*Ammospiza nelsoni*, Maine Species of Concern). In addition, the following species were documented in Spurwink Marsh by the University of New Hampshire in 2024 (Kovach et al. 2025):

American Black Duck (*Anas rubripes*)
Barn Swallow (*Hirundo rustica*)
Common Grackle (*Quiscalus quiscula*)
Double-crested Cormorant (*Nannopterum auritum*)
European Starling (*Sturnus vulgaris*)
Glossy Ibis (*Plegadis falcinellus*)
Greater Yellowlegs (*Tringa melanoleuca*)
Least Sandpiper (*Calidris minutilla*)
Lesser Yellowlegs (*Tringa flavipes*)
Red- winged Blackbird (*Agelaius phoeniceus*)
Virginia Rail (*Rallus limicola*)
Willet (*Tringa semipalmata*)
Nelson's Sparrow (*Ammospiza nelsoni*)
Eastern Kingbird (*Tyrannus tyrannus*)
Snowy Egret (*Egretta thula*)
Great Egret (*Ardea alba*)
Tree Swallow (*Tachycineta bicolor*)
Cedar Waxwing (*Bombycilla cedrorum*)
Common Yellowthroat (*Geothlypis trichas*)
Mourning Dove (*Zenaida macroura*)
Song Sparrow (*Melospiza melodia*)
Swamp Sparrow (*Melospiza georgiana*)
Mallard (*Anas platyrhynchos*)
Great Blue Heron (*Ardea herodias*)
Killdeer (*Charadrius vociferus*)
Yellow Warbler (*Setophaga petechia*)
Semipalmated Sandpiper (*Calidris pusilla*)

The Beginning with Habitat Focus Areas of Statewide Ecological Significance (https://www.maine.gov/dacf/mnap/focusarea/scarborough_marsh_focus_area.pdf) lists several rare animals that are known to occur in this area including:

Common Moorhen (*Gallinula chloropus*)
Harlequin Duck (*Histrionicus histrionicus*)
Least Bittern (*Ixobrychus exilis*)
Arctic Tern (*Sterna paradisaea*)
New England Cottontail (*Sylvilagus transitionalis*)

6. Existing soil conditions:

Soil present at the site is tidal marsh peat, characterized as the Tm soil type by NRCS (Pemaquid, Todds point).

7. Existing vegetation in impacted area(s):

The existing vegetation community at the Spurwink Marsh project site consists of a range of native salt marsh species that are increasingly stressed due to sea level rise and prolonged inundation and soil saturation. A significant portion of the marsh platform has experienced vegetation die-off, driven by impaired hydrology, resulting in the formation of mega-pools. These features are consistent with broader patterns of marsh subsidence observed in southern Maine salt marshes. Where vegetation persists, the dominant plant species include *Spartina alterniflora* (short-form on the marsh platform, tall-form along tidal creeks), *Spartina patens, Distichlis spicata,* and *Juncus gerardii*, species representative of both high and low marsh zones. Brackish marsh plant species are also present along the upland edge of the marsh upstream of Sawyer Road, including *Typha angustifolia* (narrowleaf cattail) and *Bolboschoenus robustus* (saltmarsh bulrush). Vegetation survey data collected during 2024 rapid assessments indicate that approximately 47% of the area supports high marsh vegetation, while low marsh species comprise about 8.5% of total cover (Kovach et al. 2025). The rare species *Agalinis maritima* (Saltmarsh False-foxglove), listed as a State Special Concern plant, has been identified at the project site. Invasive *Phragmites australis* is present within the marsh, with denser stands identified upstream of Sawyer Road and smaller patches downstream.

C. Restoration Area(s): Provide the following for each area where restoration and/or enhancement will take place.

1. Restoration and/or Enhancement Activities:

Restoration (road removal): Types of activities will include removal of roadbed fill/pavement and regrading, removal of riprap, removal of tidal crossing structure, and bank regrading. Activities may also include bank stabilization and vegetation planting in restoration areas if needed as part of adaptive management.

Enhancement (marsh surface hydrology): A critical step in surface hydrology enhancement is mapping and interpretation of prior alterations including legacy agricultural modifications (e.g. ditching, embankments etc., see Adamowicz et al. 2020). These historical alterations have fragmented the marsh into artificial "tidesheds" with distinct drainage patterns and subsidence trajectories. Mapping these features is essential for designing a drainage system that is appropriately sized while avoiding unintended activation of subsurface ditches, which can exacerbate vegetation loss and result in marsh collapse.

Informed by these mapped features, the enhancement design will use "single-channel hydrology" that re-establishes continuous, shallow flow paths across the marsh platform. Enhancement activities may include runnel creation, strategic ditch maintenance, and targeted ditch remediation to restore drainage and halt the expansion of mega-pools. Where feasible, small microtopography mounds may also be constructed to diversify habitat for saltmarsh sparrows and other wildlife. If needed for adaptive management, invasive species (e.g. *Phragmites australis)* control measures may also be implemented.

These actions are critical given current and anticipated stressors—including rising sea levels and the approach of the high period of the Metonic high cycle—which can interact with remnant farming infrastructure to accelerate marsh degradation.

The project will be conducted as a "Design-Build" project which will be initiated upon acceptance of this Work Plan. Milestone payments will be requested according to the project agreement. Enhancement actions and locations will be determined in the design phase by a qualified contractor that will be identified following approval of this Work Plan by MNRCP. Details of proposed enhancement actions will be shared with MNRCP at the start and midpoint of the design process, and finished designs will be submitted to MNRCP when finalized. As-built plans will be provided following completion of the work.

Runnels are shallow, narrow channels that help drain waterlogged areas by lowering water levels in the upper root zone without drying or oxidizing underlying peat. This supports plant growth, prevents vegetation loss, and encourages natural pool succession.

Ditch remediation involves gradually healing old agricultural ditches through a bottom-up process that uses plant material, typically sourced on site. Ditch remediation in combination with single channel hydrology design seeks to restore more natural tidal flow, promote sediment buildup, and reduce peat oxidation and elevation loss. It is an iterative process that helps reverse over-drainage and enhances marsh resilience.

Microtopography mounds are small, raised areas constructed using on-site sediment (e.g., from runnel excavation) to create elevated habitat patches. These features support the growth of high marsh vegetation and may provide critical nesting habitat for species such as the Saltmarsh Sparrow. Mounds are typically built at or above the local Mean Higher High Water (MHHW) tidal elevation to reduce the risk of flooding during the breeding season.

a. Wetland Classes:

The removal of the roadbed and restoration of that location will result in Estuarine Intertidal Emergent Persistent Irregularly Flooded (E2EM1P) wetland. Modifications to marsh surface hydrology across the 31-acre enhancement areas will result in Estuarine Intertidal Emergent Persistent Irregularly Flooded (E2EM1P) wetland.

b. Stream Characteristics:

An approximately 65-foot-long section of the tidal channel will be restored through the removal of the culvert and road and grading of the stream banks. The channel is restricted and the restored width will be determined during design. The characteristics of the restored channel will be designed to match conditions in a free-flowing reference reach of the stream outside of the hydraulic influence of the culvert. The reference targets will be identified during the design phase of the project, and will be characterized using a qualitative approach modified from the Stream Visual Assessment Protocol Version 2 (NRCS 2009).

Table 2. Summary of proposed restoration/enhancement amounts.

Resource type	Compensation method	Wetland Area (SF or Acres)	Stream Length (LF)
Estuarine intertidal (E2)	*Restoration*	*1.8 acres*	
Estuarine intertidal (E2)	*Enhancement*	*31 acres*	
Estuarine and Marine Deepwater	*Enhancement*		*65 feet*
	TOTAL:	***31 acres***	***65 feet***

2. Functions and Values:

The **enhancement** area meets the same wetland functions and values criteria as described above (Table 1) for the project site as a whole. At this time, the project site is on a subsidence trajectory and will lose wetland functions and values under a "no action" scenario. Thus, this project will not only stabilize existing functions and values but will improve them over time as the marsh platform itself stabilizes and resumes an elevation building trajectory.

The **restoration** activities (road/culvert removal) will improve the functions and values described above, which are essentially absent under the current developed conditions. Improvements to functions will advance in connection to those in the adjacent enhancement areas as the water table elevation stabilizes and natural colonization of vegetation takes place.

As a result of this project, we anticipate increased vegetation cover and density on the marsh platform - improving potential nesting habitat for the at-risk Saltmarsh Sparrow and increasing overall marsh resilience to sea level rise. We expect to restore tidal flows and create more natural hydrology that allows native marsh plants to thrive, which supports native species.

The design phase will include a qualitative assessment of the tidal channel at the culvert in comparison to a reference reach in order to describe the functional gain of the small stream restoration.

3. Target fish and/or wildlife species:

Activities will return the marsh to a densely vegetated salt marsh platform that is able to build elevation with the goal of keeping pace with sea level rise to continue to provide habitat for saltmarsh sparrows. Habitat diversity will be maintained by preserving some current deep pools, ensuring open-water habitat for aquatic species and foraging birds while increasing high marsh areas to support diverse plant species and nesting marsh birds.

4. Design Constraints:

The project implementation footprint is currently limited to land within the municipal and U.S. Fish and Wildlife Service properties; however, the restoration and enhancement design will consider the broader marsh hydrology beyond refuge boundaries. Access to the project site is available along Sawyer Road and at the end of an unimproved right-of-way held by USFWS. Equipment access will utilize the existing roadway when possible and will be managed to minimize unintended effects on the marsh.

Restoration and enhancement activities, as they include dredging and filling, will require permits from both federal and state agencies (see section 9). Additionally, we will coordinate with other relevant state and federal agencies to ensure compliance with environmental review processes.

Generally, most construction work will be restricted to neap tide cycles to reduce trampling and compression impacts. We also anticipate enhancement and restoration activities will be restricted to outside of the saltmarsh sparrow nesting season, with work expected to occur from October to mid-May.

Construction will need to proceed on a phased timeline, with enhancement activities occurring first to make use of the existing roadway and restoration activities occurring the following year.

5. Construction oversight:

A wetland scientist shall be on-site to monitor construction in the roadway and marsh area(s) for compliance with the Restoration Work Plan and to make adjustments when appropriate to meet restoration goals. A hired consultant will provide part-time oversight of the road removal process to ensure that the design is followed and that any appropriate changes are reviewed and implemented in the field. The hired firm will also ensure that permit requirements are met.

6. Project construction timing:

Construction timing at the project site will be limited by state and federal permit requirements, the saltmarsh sparrow nesting season (May to September), availability of equipment or materials, and neap tides. Construction will proceed in a phased approach over two years to allow enhancement work to be completed prior to road removal and restoration activities.

7. Responsible parties for all aspects of project:

Responsible parties include the Town of Cape Elizabeth (Maureen O'Meara, Town Planner), Town of Scarborough (Jami Fitch, Sustainability Manager), Rachel Carson National Wildlife Refuge (Karl Stromayer, Refuge Manager; Dr. Susan Adamowicz, Salt Marsh Restoration Scientist), Wells National Estuarine Research Reserve (Jacob Aman, project partner), and restoration consultants to-be-determined.

8. Threat to Aircraft:

The Project area is located approximately 4 miles due southeast from the Portland International Jetport and is located within an existing wetland. The work described in this Work Plan will not create a new attractant to waterfowl that would significantly alter existing avian threats to aircraft in the area.

9. Permitting:

This project is subject to applicable federal, state, and local laws, regulations, policies, and procedures. The Maine Department of Environmental Protection has advised that this project can proceed under a Permit by Rule (PBR). Federal permitting through the Army Corps of Engineers is to be determined. Local Resource Protection Permits and Floodplain permits are required by the Town of Cape Elizabeth. The Town of Scarborough does not require any permits for this work. The hired consulting

firm will lead the permitting processes with all regulating entities. Any post-construction reporting required by the regulating agencies will be completed by the hired firm.

Pre-application meetings have been requested with USACE and Maine DEP. Separate permits may be sought for the enhancement and restoration phases of the project so that construction may proceed on schedule. Consultation with the following agencies is expected for this project:

Federal Permits and Consultations

- U.S. Army Corps of Engineers (USACE)
    - Section 404 Permit: Required for the discharge of dredged or fill materials into wetlands or waters of the United States, including tidal salt marsh restoration.
- U.S. Fish and Wildlife Service (USFWS)
    - Endangered Species Act (ESA) Section 7 Consultation: Necessary due to potential presence of federally listed species and candidate species, such as Northern Long-eared Bat, Monarch Butterfly, and migratory bird species like Bald Eagles.
    - Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act Consultation: Required to minimize impacts to migratory bird species and Bald Eagles.
    - Special Use Permit, Rachel Carson National Wildlife Refuge.
- NOAA Fisheries
    - Essential Fish Habitat (EFH) Consultation (Magnuson-Stevens Act): Required to address potential impacts to essential fish habitats, including habitats for Atlantic salmon, striped bass, American eel, and other important fish species.
- National Environmental Policy Act (NEPA)
    - Required for projects with federal involvement, including federal permits or funding.
- National Historic Preservation Act (Section 106)
    - Consultation required with Maine State Historic Preservation Office (SHPO) and Tribal Historic Preservation Offices (THPOs) regarding potential impacts to historical and archaeological resources.
- United States Coast Guard (USCG)
    - Consultation required with the USCG for activities affecting navigation under Section 9 of the Rivers and Harbors Act.

State of Maine Permits and Consultations

- Maine Department of Environmental Protection (DEP)
    - Natural Resources Protection Act (NRPA) Permit: Required for wetland alterations and restoration activities.

- Permit By Rule (PBR): May apply for restoration activities (PBR Section 12 - Restoration of natural areas; PBR 13: Habitat creation or enhancement and water quality improvements). Notification to DEP required 14 days p work.
- Maine Water Quality Certificate (if an individual permit is requ

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Note that recent legislation changed the PBR review time from 14 calendar days to 20 working days.

- Maine Natural Resource Conservation Program (MNRCP)
  - Approval from the Interagency Review Team (IRT), DEP, and U project initiation. A minimum 35-day review period is mandat
- Maine Department of Inland Fisheries and Wildlife (MDIFW)
  - Coordination required for projects involving state-listed threatened and endangered wildlife species such as Saltmarsh Sparrow (Endangered) and Nelson's Sparrow (Species of Concern).
- State Historic Preservation Office (SHPO)
  - Required to ensure project activities will not adversely affect historical or archaeological resources. (See Section 106 above)

Local Permits and Tribal Consultations

- Municipal Permits (Towns of Scarborough and Cape Elizabeth)
  - Shoreland zoning, Resource Protection Permit (Town of Cape Elizabeth) and other local code enforcement approvals for the removal of roadway and restoration of salt marsh habitat.
- Tribal Historic Preservation Offices
  - Consultation with Maine Tribal Historic Preservation Offices (THPOs) will be initiated as part of the permitting process to ensure that any potential impacts to tribal cultural resources are appropriately identified and addressed. Coordination will follow state and federal requirements and will include outreach to relevant tribal representatives early in project planning.
  -

10. Changes to Approved Work Plan:

Project staff will initiate consultation with MNRCP staff in a timely manner should any proposed material changes to the approved project design and/or plans come up before, during, or after construction. It is understood by Project staff that proposed material changes that affect Project outcomes shall be reviewed and approved by TNC, DEP, and the Corps prior to implementing any of the changes.

D. Hydrology

1. Adequate hydrology:

The Spurwink River is a tidal water course that connects the project area to downstream tidal marsh and the Atlantic Ocean. The Spurwink River is restricted by the Route 77 bridge downstream of the project, as evidenced by previous hydrologic study and a visible head differential through the structure on running tides. Removal of the road and culvert and restoration of the area to tidal wetland will allow the full tidal range available upstream of Route 77 to reach the project area. Enhancement activities will further improve availability of tidal flooding to the salt marsh.

As part of the design-build process, hydrologic and hydraulic modeling will be conducted to inform restoration design decisions in the restoration and enhancement areas. The modeling will evaluate current site conditions and guide design of grading plans, drainage pathway placement, higher elevation features, and other design elements intended to improve tidal hydrology, nesting habitat, and marsh resilience.

Modeling will focus on the following objectives:

- Inform the enhancement design through quantification of the expected tidal prism and extent of tidal flooding for various tidal datums.
- Quantify current tidal exchange limitations caused by existing infrastructure.
- Estimate the restored tidal range and inundation frequency following roadbed and culvert removal and restoration.
- Assess potential flow velocities in adjacent tidal channels for potential scour or erosion and determine whether shoreline stabilization would be required where culvert and current channel abutments (and fill) exist.
- Identify suitable elevations for revegetation zones to match preferred tidal marsh vegetation requirements.

Modeling outputs will be integrated with topographic and elevation survey data and used to define final target elevations and design specifications. The results will be used to finalize restoration grading plans and will support permitting documentation, including demonstration of hydrologic connectivity and restoration of tidal flow regimes.

The modeling will be conducted by a qualified professional as part of the contracted design-build team. Final model documentation and design updates will be submitted to MNRCP as part of the design deliverables package.

2. Water source(s):

The primary water source at the project site is tidal flooding from the downstream marsh channels. Additional water sources include groundwater and surface runoff from the surrounding uplands and developed areas, and freshwater inputs from the Spurwink River. These sources have been documented through pre-restoration monitoring of marsh and channel hydrology, and through modeling of tidal and freshwater inputs (McLean 2019).

E. Grading Plan

For the restoration areas, grading plans will be developed as part of the project design phase. Geotechnical investigations will be carried out to determine the composition and depth of roadbed materials.

Roadbed material will be removed, and the area regraded to allow the appropriate amount of tidal inundation to support salt marsh vegetation growth and peat formation. Elevations will be explicitly identified in restoration plans. Elevations will be designed to support sheet flow and drainage, habitat diversity, and nesting bird refugia.

Tidal road crossing materials will be removed and stream banks at the site of the culvert will be regraded/stabilized to allow establishment of salt marsh vegetation. Banks will be temporarily stabilized, with biodegradable materials such as coir fiber mats, until bank vegetation becomes established.

Runnels will be created to allow excess surface water to drain to existing tidal channels. Runnels are shallow, narrow channels typically 12-30 inches wide and approximately 6 inches deep. The depth is adjusted to allow for a positive gradient that promotes flow and prevents runnel clogging while still retaining existing sediment in the enhancement area.

Structured Microtopography Mounds may be created from materials removed from runneling to provide higher elevation areas. These areas serve as potential nesting habitat for Nelsons and Saltmarsh sparrows. Mounds will be located at a suitable elevation for supporting high-marsh vegetation, such as *Spartina patens*, which is expected to revegetate within one growing season from propagules present in excavated local marsh soils. The number of mounds will be dependent on the amount of material removed. Mounds will be located only where peat strength is sufficient to hold the weight of sediment additions without causing significant compaction of underlying soils. Mound height will not exceed the elevation of local native salt marsh vegetation.

Ditch remediation is not anticipated to be employed for this project based on the limited extent of ditch networks within the project site. However, if it is determined during the design phase that this enhancement method is needed, appropriate plans will be developed.

1. Plan View: Please provide plans for the restoration/enhancement areas that meet the following specifications.
    a. Existing grade elevations and proposed grading plans.
    b. Microtopography. Natural wetland systems, particularly those with trees and/or shrubs, typically have an intricate pattern of topographic relief. Where microtopographic variation is planned (such as in a forested wetland), the proposed maximum differences in elevation should be specified. The plan does not need to show the locations of each pit and mound as long as a typical cross-section and approximate number of pits and mounds is given for each zone. Restored areas should have variability (elevational and size) similar to that found in a similar natural area or a suitable reference area. For streams, some of the relevant information includes planform geometry, channel form, watershed size, design discharge, length, sinuosity, riffles/pools, and floodplain.
    c. Scale is in the range of 1”=20’ to 1”=100’.
    d. All items on the plan are legible. Electronic documents of suitable quality are encouraged.
    e. Plans have a bar scale.
    f. The drawings show the access for maintenance and monitoring.

Plan view drawings for the enhancement and restoration activities will be provided during the design

phase of the project and will accompany state and federal permit applications.

2. Cross Sections: Include representative cross-sections showing the existing and proposed grading plan, expected range of shallow groundwater table elevations or surface water level consistently expected. Cross-sections should include key features such as upland islands and pools. They should extend beyond the restoration/enhancement site into adjacent wetlands and uplands.

Cross sectional drawings for the enhancement and restoration activities will be provided during the design phase of the project and will accompany state and federal permit applications.

3. Soil Compaction:

To reduce compaction at the site, we will utilize low ground-pressure machinery, and where possible, hand tool techniques. Other measures include use of construction mats, where warranted, and minimizing foot traffic.

4. Professional Assistance:

The Town of Cape Elizabeth, in cooperation with the Town of Scarborough, will hire an engineering firm to complete the necessary geotechnical and boundary surveys; engineered design; local, state, and federal permits; construction bid documents; and construction oversight for the removal of 1400-feet of paved road and sub-base from the Spurwink Marsh. The design will include hammerhead turnarounds on both ends of the road, designed according to each municipality's public roadway standard specifications. The firm will assist in identifying right-of-way acquisition areas that may be needed to construct the turnarounds. The design of the public right-of-way dead ends must meet applicable municipal ordinance requirements for each Town. The hired firm will work in collaboration with the project's ecological experts to ensure the road removal design minimizes impact to the marsh and supports the future restoration activities.

The hired firm will assist with the construction bidding process. The firm will prepare the bid documents, including but not limited to, bid advertisement, design plan set, project specifications, engineers' opinion of costs, bid forms and templates, and list of potential bidders. The firm will also provide a bid tab outlining the results of the bid opening and provide a review of the bid results for any errors, omissions, or oddities.

The town will carry out a Request for Qualifications process to select qualified consultants to implement activities in the Work Plan as needed.

F. Topsoil or Substrate

1. Proposed source of topsoil or substrate material:

The primary source of substrate material for use in the restoration areas will be native material excavated from the removal of the existing road and culvert. Where appropriate, this material will be temporarily stockpiled on-site for later use during restoration. If additional material is required, an off-site source will be identified that is free of invasive plant seeds or other contaminants.

Any soils excavated from the enhancement areas will be reused on-site as part of the design, either to build elevation in low elevation areas, or for construction of structure microtopography mounds.

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The Army Corps said active planting in the road restoration area will be required.

2. Depth:

Depth will be determined as part of the design process, following geote

3. Appropriate organic content of topsoil:

Native soils reused on-site are expected to contain adequate organic content for salt marsh revegetation. If supplemental materials are required, organic content will be determined as part of the design process.

4. Storage of soil/substrate materials:

All excavated soil materials will be stockpiled in designated upland staging areas and will be protected with erosion and sediment control measures (e.g., silt fence, stabilized perimeter).

5. Tidal Wetlands:

There is no specific standard for organic content in tidal wetland substrate, but reused native marsh substrate is expected to closely match reference conditions.

6. Vernal Pools: Not applicable.

G. Erosion Controls

1. Erosion Control Measures:

Erosion control measures shall be consistent with the State of Maine Erosion and Sediment Control Best Management Practices (BMPs) October 2016. Erosion controls such as silt fencing, hay bales, or other appropriate sediment barriers will be installed around active work areas prior to the start of construction activities where needed in the restoration area. These measures will be placed in locations that intercept and filter runoff, particularly at the downslope edges of disturbed areas.

2. Stockpile Management:

Soil and substrate stockpiles will be covered with erosion control materials appropriate to their size and anticipated storage duration. Acceptable covers include tarps, erosion control blankets, straw mulch combined with temporary seed, or other stabilization materials. Stockpiles will be located in upland areas outside the wetland boundary and at least 75 feet from sensitive resource areas whenever practicable.

3. Inspection and Maintenance:

All erosion and sediment control measures will be inspected at least once per week and within 24 hours of significant precipitation events (>0.5 inch). Repairs or replacements will be made immediately if controls are found to be damaged or ineffective. Inspection logs will be maintained and included in construction oversight documentation.

4. Removal of Temporary Controls:

Temporary erosion control measures will be removed as soon as the site is stabilized with permanent vegetation and/or other appropriate measures. The deadline for removal will be specified in the construction schedule and will occur no later than the conclusion of Year 1 monitoring, unless extended due to unforeseen site conditions.

H. Planting Plan

5. Native Plant Materials:

Vegetation in the wetland restoration areas will be allowed to reestablish naturally through propagules in the sediment, natural seeding, and rhizome expansion from adjacent marsh vegetation. Given the presence of native seedstock in the marsh sediment and favorable hydrologic conditions expected post-restoration (i.e., water table elevation approximately 8–10 inches below the surface), active planting is not proposed as part of the initial implementation phase. Similar projects in Rhode Island have found that planting in the first year is often a failure due to changing soil chemistry (personal communication with Wenley Ferguson, Save the Bay). Newly exposed anoxic soils undergo redox process that can produce compounds such as sulfuric acid which are not conducive to supporting plantings. It is recommended to wait until at least the second year to evaluate how natural unassisted revegetation is progressing, and if necessary, add planting at that time.

Natural revegetation is the preferred method of establishing vegetative cover, as it promotes the recovery of locally adapted plant phenotypes that are better suited to site-specific salinity, hydrology, and elevation conditions. In contrast, the success of establishing plantings using nursery-grown material may be contingent on the availability of appropriate phenotypes, which may not fully match the ecological conditions of the restoration site. For this reason, planting is reserved as a contingency measure rather than a default practice. When necessary, native seedlings will be obtained from an appropriate local or regional source with a track record of successful establishment in Maine salt marshes.

Vegetation recovery will be monitored according to this work plan schedule beginning in the first growing season following restoration. If monitoring indicates insufficient species colonization by the end of the first growing season, targeted plan part of the adaptive management plan. If planting becomes necessary, sp will follow MNRCP guidance and will be informed by reference site con the following native marsh species:

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The agencies don't disagree here. Perhaps doing a transplanting program by taking small plugs from the adjacent marsh would avoid this issue?

- *Spartina patens* (salt hay)
- *Distichlis spicata* (spikegrass)
- *Juncus gerardii* (blackgrass)
- *Spartina alterniflora* (smooth cordgrass)

Upland areas outside of the marsh where the road is removed will be stabilized, as needed, with a combination of planting native plugs and seeding using a native upland seed mix appropriate to site conditions to provide rapid temporary cover.

To reduce the immediate threat and minimize the long-term potential of degradation, the species included in the U.S. Army Corps of Engineers "Invasive and Other Unacceptable Plant Species" list in the 2016 Mitigation Guidance, as well as the species listed on the Maine Department of Agriculture, Conservation, and Forestry's list of Invasive Terrestrial Plants, shall not be included as planting stock in the overall project. Only plant materials native and indigenous to the region shall be used (with the exception of *Secale cereale* (winter rye). Species not specified in the plan shall not be used without prior written approval from MNRCP.

6. Community classification: Estuarine Intertidal Emergent Persistent Irregularly Flooded (E2EM1P) wetland.

7. Plan view drawings:

Plan view drawings for the restoration and enhancement areas will be developed during the design phase. These will indicate anticipated revegetation zones based on tidal elevations and species requirements. Drawings will be submitted with permit application packages and shared with MNRCP when available.

8. Cross-section plans:

Cross-sectional drawings will be integrated with grading plans for the restoration areas. These will identify vegetative community zones, with tidal elevation bands referenced to mean high water (MHW) and spring high water. These will be included in state and federal permit applications and shared with MNRCP upon completion.

9. Wetland zones:

The structural determinant species for the restored wetland community are *Distichlis spicata* and *Spartina alternaflora*, followed by *Spartina patens*. Natural revegetation is expected to be sufficient to establish these species. Monitoring will assess establishment success, and planting may be implemented under adaptive management if needed to achieve target cover within the restored marsh platform.

10. Woody stock:

Not applicable – woody vegetation is not proposed or ecologically appropriate for the restoration site.

11. Herbaceous stock:

If planting becomes necessary under the adaptive management plan, herbaceous species will be selected based on site-specific conditions. Salt marsh species that spread by rhizomes will be planted at spacing equivalent to 3 feet on center; clump-forming species will be planted at approximately 2 feet on center, subject to design-phase determination.

12. Seed mix:

Seed mixes used for upland stabilization will consist of native species appropriate to site conditions and free of invasive species, non-native genotypes, or cultivars. All seed materials will be reviewed to ensure compatibility with regional ecological conditions.

13. Relocation of plantings:

Planting in the restoration area is proposed as an adaptive management action only. It is unlikely that plants would need to be relocated within this area as all areas are expected to support target species.

14. Irrigation:

We do not anticipate the need for irrigation in restored areas because water will be delivered naturally through tidal exchange and precipitation. Seeded upland areas will be irrigated as needed with truck mounted equipment.

15. Use of Mulch:

The specifications and extent of mulch, if necessary at all, will be determined during the design phase.

16. Tidal Wetlands:

Planting is not proposed as part of the restoration design, which will rely on natural revegetation processes. Planting may be implemented as an adaptive management measure.

17. Vernal pools:

Vernal pools are present in the project area.

18. Stream banks:

Stream banks in the area where the culvert will be removed are expected to revert to conditions typical of natural tidal channels, which include areas of erosion and accretion. The design process will evaluate the need for bank stabilization and will also recommend adaptive management measures.

H. Coarse Woody Debris and Other Features

No coarse woody debris will be utilized as part of this project.

I. Invasive and Noxious Species

Disturbance from construction activities can create conditions conducive to the colonization of invasive plant and animal species. In particular, excavation, grading, or stockpiling can expose mineral soils that are vulnerable to invasion. Additionally, construction equipment can transport seeds or propagules of invasive species; therefore, all equipment will be thoroughly cleaned prior to arrival on-site to prevent contamination.

An **Invasive Species Control Plan (ISCP)** will be implemented as part of this restoration project and will include the following elements:

1. **Risk Assessment:**

The project site includes a known population of *Phragmites australis* located along the western edge of the salt marsh near the enhancement area. These stands represent a risk of expansion into the restoration area. Risk factors include:

- Soil disturbance and exposure
- Hydrologic alteration that could reduce salinity and promote *Phragmites australis* spread
- Introduction of propagules via equipment or materials

2. **Constraints:**

The use of herbicides for invasive plant control may require permitting under state regulations. Mechanical and hand removal methods will be preferred where feasible, particularly in sensitive wetland areas. If herbicide application is determined necessary, all treatments will comply with Maine DEP regulations and will be applied by licensed professionals.

3. **Prevention and Control Measures:**

- All equipment entering the site will be cleaned off-site to prevent seed dispersal.
- Backfill material will be sourced from areas free of *Phragmites* or other invasive propagules.
- Microtopography mounds will not be constructed at elevations too high (>10cm above MHHW), as this could promote colonization by invasive species.
- Site monitoring will occur annually during the growing season for the duration of the monitoring period.
- If invasive species are identified growing onsite, the ISCP will be activated and may include mechanical removal, targeted herbicide application, or other appropriate strategies.
- No species from the U.S. Army Corps of Engineers' "Invasive and Other Unacceptable Plant Species" list or the Maine DACF Advisory List of Invasive Plants will be used in any planting or seeding on the site.

4. **Tidal Wetland Considerations:**

Special care will be taken to avoid freshwater intrusion into the marsh platform, which can increase the risk of *Phragmites australis* invasion. Design elements will maintain appropriate salinity and drainage conditions to suppress freshwater-tolerant invasives. In the event that *Phragmites* expands into the restoration area, a targeted treatment plan will be developed. Monitoring will differentiate between non-native and native subspecies (*P. australis ssp. americanus*). Native stands, if encountered, will be conserved.

J. Off-Road Vehicle Use

Note: This section addresses unauthorized recreational off-road vehicle (ORV) use that may threaten restored or enhanced areas following construction. The use of construction-phase equipment is addressed in other sections of the Work Plan (e.g., Construction Access, Staging, and Erosion Control).

1. Current Off-Road Vehicle Use:
There is currently no known authorized off-road vehicle use within the restoration and enhancement areas. Anecdotal observations have noted occasional foot or recreational use near the existing road corridor, but no persistent vehicle access into marsh areas has been documented. End of road turnarounds will be designed to prevent vehicular access to the marsh and to discourage foot access.

2. Control Plan:
To prevent future impacts from off-road vehicle use that could degrade restored or enhanced marsh

areas, the following measures will be implemented: Post-construction site access controls: Physical barriers (e.g., boulders, split rail fencing, or gate systems) will be installed at logical entry points and former road ends to prevent unauthorized vehicular access to restoration areas.

- Signage: Educational signage will be installed at the turnarounds to indicate the ecological sensitivity of the site and prohibit unauthorized off-road vehicle access.
- Monitoring and enforcement: Site monitoring during the post-construction phase will include inspections for signs of off-road vehicle entry. Any disturbance will be documented and addressed by installing further barriers.
- Partnership with landowners and municipal staff: Coordination with USFWS (Rachel Carson NWR), municipal conservation commissions, and adjacent landowners will be pursued to support enforcement and stewardship messaging.
- Design considerations: Final grading and restoration design will incorporate berms, vegetation, or topographic features that passively deter vehicle use while preserving visual aesthetics, if applicable.
-

K. Notification of Construction Completion

Within 60 days of completing a project that includes restoration, enhancement, or creation activities, the construction sponsor, Town of Cape Elizabeth, will submit to the MNRCP a report specifying the date of completion of the restoration/enhancement work. The report shall include:

- A description of the work performed
- The date(s) of completion
- As-built plans
- Photographs of the site taken before, during, and after construction

If restoration or enhancement is initiated in, or continues throughout the year, but is not completed by December 31 of any given year, the Town of Cape Elizabeth will provide the MNRCP with a letter outlining:

- The date mitigation work began
- Progress as of December 31
- The anticipated timeframe for final completion

This letter will be submitted to the MNRCP no later than January 31 of the following year.

L. Performance Standards

This section outlines the specific performance standards that will be used to evaluate progress toward achieving the ecological goals and objectives of this restoration and enhancement project. Performance standards are ecologically based, objective, and have measurable benchmarks designed to demonstrate functional improvement of aquatic resources and to track restoration outcomes relative to baseline and reference conditions. They provide a transparent and repeatable framework for assessing whether the site is trending toward the desired restoration trajectory. Where appropriate, standards are compared to conditions observed at a reference site, serving as a model for target ecological functions and structure.

Each standard includes specific metrics with defined targets for Years 1, 3, 5, and 7 of the monitoring period, consistent with MNRCP expectations and supporting adaptive management. A summary of the performance standards that will guide monitoring and inform necessary management interventions is included in Table 4.

M. Long-Term Monitoring Plan

Monitoring Methods

For the first, second, third, fifth, and seventh full growing seasons following construction of the restoration/enhancement sites, the sites will be monitored, and annual monitoring reports will be submitted. Observations will occur at least twice during the growing season: a post-winter qualitative field check once in late spring/early summer of the entire project area and monitoring of key marsh functions in both the restoration area and the three enhancement areas during the summer and early fall. The first year of monitoring will be during the first full growing season after completion of construction. A growing season is defined as starting no later than May 31 through first killing frost. A monitoring activity timeline is included in Table 3.

Monitoring will follow a Before-After-Control-Impact (BACI) design. 'Before' refers to the baseline condition prior to enhancement and restoration implementation. 'After' includes monitoring conducted in Years 1, 2, 3, 5, and 7 following restoration/enhancement construction. Monitoring activities will include visual observations, vegetation plots, visual cover estimates, hydrologic assessments, and photos, as outlined in the Work Plan. A list of BACI monitoring activities is provided in Table 4. Monitoring locations will be chosen in the field following standard protocols. A map of an example configuration of monitoring locations is included in Figure 6. Vegetation quadrats will consist of 60 total meter squared plots, including 20 in the control site, 20 in the area downstream of the Sawyer Rd/St restriction, and 20 upstream. This sample size is based on a statistical design utilized by U.S. Fish and Wildlife Service for detecting change at long-term monitoring sites.

Monitoring activities will follow standard protocols utilized by USFWS for vegetation and water level sampling, and RTK GNSS survey. Vegetation will be monitored through a combination of permanent plots, visual walking assessments, and photo documentation. Water levels will be monitored using a combination of continuous water level recorders and visual observations. Runnel dimensions and position and vegetation plot elevations will be measured with RTK GNSS connected to the National Spatial Reference System. Channel adjustments and vegetation of str
photo documentation.

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DEP noted that perhaps you could get by with fewer plots? If you propose this many and can stay within budget, that is fine. We are just noting that if you needed to save money/time, less would be acceptable.

Table 3. Monitoring Timeline	**Baseline 2026**	**Year 1 (2028)**		**Year 2 (2029)**		**Year 3 (2030)**		**Year 5 (2032)**		**Year 7 (2034)**	
Timeline of BACI monitoring activities	**S/F**	**W/S**	**S/F**	**W/S**	**S/F**	**W/S**	**S/F**	**W/S**	**S/F**	**W/S**	**S/F**
Site Selection	X										
Water Level Recorders	X		X		X		X		X		X
Water Level Visual Assessment	X	X	X	X	X	X	X	X	X	X	X
Vegetation Plots	X		X						X		X
Vegetation Photo Stations	X	X	X	X	X	X	X	X	X	X	X
Runnel Dimensions - RTK Survey			X				X		X		
Runnel Dimensions - Visual Assessment		X		X		X		X		X	
Invasive Plants - Photo Stations and Visual Assessment	X		X		X		X		X		X
Vegetation - Rapid Visual Assessment			X				X		X		X
Bank/slope - photo stations			X		X		X		X		X
Data Management	X		X		X		X		X		X
Submit annual report Dec 15th	X		X		X		X		X		X

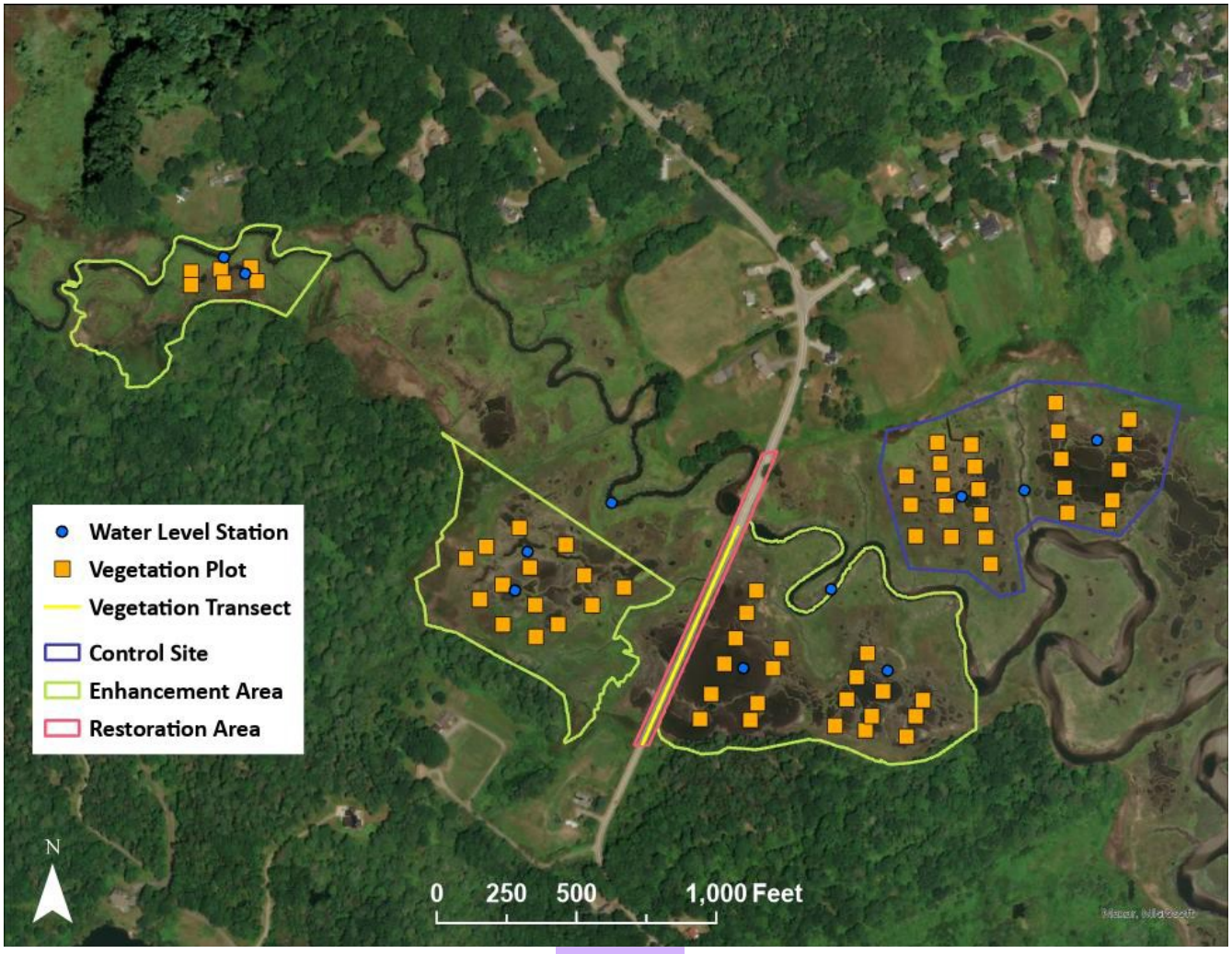

Figure 6. Map of an example configuration for vegetation and water level monitoring locations.

If there are problems identified through annual monitoring that need to be addressed, and if the measures to correct them require prior approval from the MNRCP, the project sponsor will contact the MNRCP as soon as the need for corrective action is discovered.

Remedial measures will be implemented at least two years prior to the completion of the monitoring period to attain the success standards described below at the fifth growing season following completion of construction. Should adaptive management measures be required within two years of the end of the original monitoring period, the monitoring period may be extended to ensure two years of monitoring after the remedial work is completed. Measures requiring earth movement beyond hand-shovel activities to keep runnels open or changes in hydrology will not be implemented without written approval from the MNRCP.

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I don't see the transects on this map but I assume they are lines between the plots so not a big deal.

Table 4. BACI monitoring plan timeline with performance standards and adaptive management triggers and actions (Following Burdick et al., 2022).

Goal	Technique	Objective	Monitoring Metric/Method	Temporal Frequency	Spatial Assessment	Performance Standard Year 1	Performance Standard Year 3	Performance Standard Year 5	Performance Standard Year 7	Trigger	Adaptation Action
Halt subsidence trajectory from over-saturation by increasing drainage through appropriately sized channel network	Runnel creation and unclogging ditches	Surface water/ground water levels decline in saturated areas	Water level/water level recorders	Annually for a minimum of 30 days (or longer if resources allow)	Primary tidesheds, control site	Water levels at low tide drop to within 3 - 9 inches below the marsh surface	No prolonged standing water in treatment areas, groundwater levels maintained at 3-9 inches below marsh surface at low tide	No prolonged standing water in treatment areas, groundwater levels maintained at 3-9 inches below marsh surface at low tide	No prolonged standing water in treatment areas, groundwater levels maintained at 3-9 inches below marsh surface at low tide	Water level > 9 in deep or < 3 in below surface	Insert sill or enlarge thalweg in runnel
	Runnel creation and unclogging ditches	Deep pool areas remain flooded and do not expand	Water level/visual assessment	Biannually	Selected pools	Location of deep pools revealed and maintained	Location of deep pools revealed and maintained	Location of deep pools revealed and maintained	Location of deep pools revealed and maintained	Deep pools drained	Install sill or, if naturally breached, do nothing
	Runnel creation and unclogging ditches	Target area revegetates	Vegetation/meter square plots/RTK elevations	0, 1, 5, 7 (optional year 3 based on visual surveys)	Primary tidesheds, control site	> 5% increased cover	>10% increased cover	>15% increased cover	>20% increased cover	50% less of performance standards	Add seed heads

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The agencies suggest/require also monitoring also in years 2 and 3. These years would be critical to make sure things are going as planned so you can quickly adopt and adaptive

	Runnel creation and unclogging ditches	Target area revegetates	Vegetation/photo stations	Biannually	Primary tidesheds, control site	No increase in unvegetated area	Visual decrease in unvegetated area	Visual decrease in unvegetated area	Area main		
	Runnel creation and unclogging ditches	Runnel width/depth stabilized	Runnel dimensions/RTK GNSS measurements	Years 1,3, 5	Select runnels	Self adjustment to tidal frame	No change	No change	No ch	or contracts >10% of initial dimensions	understand hydrology
	Runnel creation and unclogging ditches	Runnel width/depth stabilized	Runnel dimensions/visual inspection	Annually	All runnels	Self adjustment to tidal frame with no clogging or slumping	No change	No change	No change	Width/depth expands or contracts >10% of initial dimensions	Document change to better understand hydrology
Increase resilience to sea level rise	Runnel creation and unclogging ditches	Create conditions unfavourable for invasive/non-native vegetation	Invasive plans/visual inspections and photo stations	Annually	Entire project area (visual) and phragmites stands within project area	No expansion of *P. australis* into project areas	No expansion of *P. australis* into project areas	No expansion of *P. australis* into project areas	No expa *P. au* into p areas		

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Is unvegetated area being measured in any other way? Drone surveys? aerial photos, etc.?

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Zero may not be realistic if there is already Phrag in the area. Suggest changing this to <5% cover or something similar.

					(photo stations)						
Improve high marsh habitat for nesting tidal marsh birds	Runnel creation and unclogging ditches	Enhancement areas revegetate with suitable native plant species and thatch for tidal marsh bird nesting	Vegetation/SHARP vegetation metrics included in veg plot protocol	0, 1, 5, 7 (optional year 3 based on visual surveys)	Primary tidesheds	No change	NA	Presence of thatch	Signif incre veg h and conti prese thatc	cover and density is not increasin g	
Restore developed areas to tidal wetland	Road removal and grading	Percent cover of native halophytic vegetation increases	Vegetation/Visual cover estimate transect	1, 5, 7	Roadway	> 5% increased cover	NA	>15% increased cover	>20% incre cover		
	Planting natives	Create suitable native transition zone from marsh to	Invasive plants/visual surveys	1, 3, 5, 7	Upland transition zones	No invasive plant observed	NA	No invasive plants observed	No in plant obser		

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same comment re: monitoring in years 2 and 3 also.

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This should be a target %, like 20 or 30 in year 1, then increasing from there. It's currently 0% (because it's a road). final target of 70% by the end?

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We would also want some measure of % cover or survivability of any planted/seeded areas.

		upland									
	Culvert Removal and bank stabilization	Channel cross section is stable with native vegetation established	Bank slopes/photo stations	Year 1, 2,3, 5, 7	Channel crossing footprint	Cross section adjusts to tidal frame	Increase in channel cross sectional area is less than 10%	Increase in channel cross sectional area is less than 5% from previous assessment	Increase in channel cross sectional area is less than 5% from previous assessment	Bank erosion resulting in greater than 15% cross sectional area lost	Collect/Assess hydrologic data at site, compare to local channel evolution, confer with engineer/ hydrologist, consider living shoreline stabilization

Monitoring Reports

Annual monitoring reports will follow the format provided in the MNRCP Restoration Work Plan Guidance and will be submitted to MNRCP no later than December 15 of the monitoring year. Reports will describe site conditions and progress toward meeting performance standards, including summary data, photo documentation, and supporting appendices. Failure to perform required monitoring and submit reports may jeopardize future funding eligibility through MNRCP.

N. Adaptive Management Plan (Contingency)

Adaptive management actions for each performance standard are provided in Table 4. These proposed actions represent the minimal efforts deemed necessary to reset natural processes, primarily marsh surface hydrology and vegetation growth.

The project site will be surveyed annually for new stands of non-native or invasive plants, including those listed in Section J. Any new growth identified will be removed either by hand pulling or cutting. If more extensive growth is discovered an Invasive Species Control Plan will be developed in consultation with MNRCP and submitted for review as part of the annual report.

Signs of significant erosion or siltation will be investigated to identify whether they are resulting from the restoration and enhancement actions or from natural causes. If it is determined that the impacts are from project activities, a plan will be developed to guide corrective actions in consultation with MNRCP.

Prior MNRCP approval will not be needed for post-implementation adaptive management of hand work, which may be required to keep runnels open or move a clod of rafted winter peat. MNRCP will be notified if machine work is needed for adaptive management.

Remedial measures will be implemented at least two years prior to the completion of the monitoring period in order to attain the performance standards described in Table 4. Should measures be required within two years of the end of the original monitoring period, the monitoring period may be extended to ensure two years of monitoring after the remedial work is completed. Measures requiring earth movement or changes in hydrology will not be implemented without written approval from the MNRCP.

O. Final Assessment Plan:

A final assessment of the condition of the restoration/enhancement site(s) shall be performed during the seventh growing season (Year 7) after completion of the restoration/enhancement site(s) construction, or by the end of the monitoring period, whichever is later. "Growing season" in this context begins no later than May 31st. The assessment report shall be submitted to MNRCP by December 15 of the year the assessment is conducted; this will coincide with the year of the final monitoring report, so it is acceptable to include both the final monitoring report and assessment in the same document.

The final assessment shall include the four assessment appendices listed below and shall:

- Summarize the original or modified restoration/enhancement goals and discuss the level

of attainment of these goals at each restoration/enhancement site.

- Describe significant problems and solutions during construction and maintenance (monitoring) of the restoration/enhancement site(s).

- Recommend measures to improve the efficiency, reduce the cost, or improve the effectiveness of similar projects in the future.

FINAL ASSESSMENT APPENDICES:

Appendix A -- Summary of the results of a functions and values assessment of the restoration/enhancement site(s). This assessment should compare the functions and values of the site(s) at the end of the monitoring period to the functions and values prior to the restoration/enhancement work. Note improvements and/or changes in functions and values. Functions and values should be described using the same methodology used in the original work plan (e.g., the Highway Methodology). For stream restoration/enhancement projects, the SVAP2 assessment should be used to compare the condition of the site at the end of the monitoring period to the condition prior to the restoration/enhancement work.

Appendix B -- Calculation of the area by type (e.g., wetlands, vernal pools) of aquatic resources in each restoration/enhancement site. Wetlands should be identified and delineated using the most current versions of the Corps Wetlands Delineation Manual and approved regional supplement. Supporting documents shall include (1) a scaled drawing showing the aquatic resource boundaries and representative data plots and (2) datasheets for the corresponding data plots.

Appendix C -- Comparison of the area of **actual** delineated restored/enhanced aquatic resources (from Appendix B) with the area of **proposed** restored/enhanced aquatic resources from the Restoration Work Plan. Also provide a comparison of the different community types present as compared to what was proposed in the Work Plan. In other words, how does the site compare to what was planned? These comparisons may be made on a scaled drawing(s) or as an overlay on the as-built plan.

Appendix D -- Photos of each restoration/enhancement site taken from the same locations as the monitoring photos. Include a map showing photo point locations (required).

Completion of Monitoring Requirements. Monitoring requirements will not be considered fulfilled until the awardee has received written concurrence from the Maine Natural Resource Conservation Program that the project has met its objectives and no additional monitoring reports are required. A final field visit may be conducted to verify that onsite conditions are consistent with information documented in the monitoring reports.

P. Long-Term Management Plan

Following the completion of post-construction monitoring and the achievement of performance standards, the restored and enhanced areas will be managed to ensure the long-term sustainability of natural resource functions and values.

The long-term management responsibility for the site will reside with the Town of Scarborough, Town of Cape Elizabeth, or U.S. Fish and Wildlife Service, each for their owned parcels. These entities will be responsible for ensuring that the site remains in compliance with the goals outlined in this

Restoration Work Plan, as well as with all applicable permit conditions.

Routine stewardship activities may include:

- Periodic site inspections for signs of erosion, invasive species, or other management concerns
- Maintenance of access controls (e.g., signage, barriers) to prevent unauthorized disturbance
- Coordination with local conservation organizations and agencies, as needed, to support long-term habitat protection

Areas within the Rachel Carson National Wildlife Refuge will be managed in accordance with the "Comprehensive Conservation Plan and Environmental Assessment June" (USFWS 2007).

Any future land use activities or site modifications must be consistent with the conservation and restoration goals established in this Work Plan and must not compromise the ecological integrity of the site.

Q. Payment Schedule

Upon receipt of written documentation of costs, TNC shall pay the MNRCP Contribution as follows:

- **Up to $90,000** will be paid to the Cooperating Entity following submission and approval by TNC, DEP, and the Corps of an interim status report following completion of initial environmental assessment and baseline monitoring.

- **Up to $141,000** will be paid to the Cooperating Entity following submission and approval of the Restoration Work Plan for the Project, which includes the marsh remediation design and road removal design.

- **Up to $200,000** will be paid to the Cooperating Entity following completion of the marsh surface remediation work and submission and approval of an interim status report for this portion of the Project.

- **Up to $450,000** will be paid to the Cooperating Entity following completion of the road removal work for the Project.

- **Up to $350,000** will be paid to the Cooperating Entity following completion of all restoration activities and following TNC, DEP, and the Corps' receipt and approval of:

    1. the Restoration Completion Report for the Project, and
    2. a copy of the recorded Notices of Project Agreement on the Towns' Property.

- **Up to $359,000** in contingency funding will be paid to the Cooperating Entity if:

    1. the Cooperating Entity can demonstrate, to the satisfaction of TNC, DEP, and the Corps as determined in their sole discretion, that these funds are needed for the completion of the Project, and
    2. written documentation of costs is submitted and approved by TNC, DEP, and the Corps.

TNC is not obligated to pay these contingency funds to the Cooperating Entity and shall only do so if the need is approved by DEP and the Corps.

Appendix A. References

Atlantic Coast Joint Venture (ACJV). 2024. Saltmarsh Restoration Priorities for the Saltmarsh Sparrow, Nelson's Sparrow, & Their Hybrids Maine, Version 2.1. 73pp. URL: https://acjv.org/documents/ME_SALS_comp_guidance_doc.pdf

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U.S. Fish and Wildlife Service (USFWS). 2007. Conservation Plan and Environmental Assessment. Rachel Carson National Wildlife Refuge. Wells, Maine. 199pp. URL: https://www.fws.gov/media/rachel-carson-national-wildlife-refuge-comprehensive-conservation-plan