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July 17, 2020

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
EXPANDED NOTICE OF PROJECT CHANGE (EEA#16033)
AND
EXPANDED ENVIRONMENTAL NOTIFICATION FORM (EEA#16210)

PROJECT NAMES	: Old Town Hill Salt Marsh Restoration/ Great Marsh Restoration Phase II
PROJECT MUNICIPALITY	: Newbury
PROJECT WATERSHED	: Parker River
EEA NUMBER	: 16033/16210
PROJECT PROPONENT	: The Trustees of Reservations
DATE NOTICED IN MONITOR	: May 20, 2020

Pursuant to the Massachusetts Environmental Policy Act (MEPA; M.G. L. c. 30, ss. 61-62I) and Sections 11.06, 11.10 and 11.11 of the MEPA regulations (301 CMR 11.00), I hereby determine that this project **requires** a mandatory Environmental Impact Report (EIR). The expanded pilot project will consist of two components. The Proponent submitted an Expanded Notice of Project Change (ExNPC) for the Old Town Salt Marsh Restoration component of the project (EEA#16033) and an Expanded Environmental Notification Form (EENF) for the Great Marsh Restoration Phase II component of the project (EEA#16210) to support the request that I waive the requirement to prepare a mandatory EIR (301 CMR 11.11), or if the full EIR waiver was not granted, that I allow a Single EIR (SEIR) to be prepared in lieu of the usual two-stage Draft and Final EIR process pursuant to Section 11.06(8) of the MEPA regulations. The Proponent should file a SEIR that addresses both components of the project in accordance with the Scope outlined below.

This nature-based restoration initiative proposed by the Proponent expands upon the previous pilot project at the Old Town Hill Reservation in Newbury (EEA# 16033), which is intended to restore the vital functions of salt marshes in providing habitat, recreation, and coastal resiliency benefits. As both EEA#16033 and EEA#16210 propose the same restoration techniques by the same Proponent, these projects, as described in the two separate filings submitted concurrently, will be reviewed in this

Certificate in a coordinated fashion. I appreciate the participation of the many agencies and project partners in this pilot project, including the Massachusetts Division of Ecological Restoration (DER), U.S. Fish and Wildlife Service, and Massachusetts Bays National Estuary (MassBays) Program, for applying their collective experience and expertise to maximize the environmental benefits of the project.

By conducting the proposed ditch remediation at a larger scale than previous efforts, and with the addition of the micro-runnel technique, the goal is to demonstrate the efficacy of this approach as a restoration strategy at the landscape level. The Proponent anticipates that, as monitoring information from the expanded sites is made available on the success of these restoration techniques in the coming years, generalizations can be made as to its applicability under differing site conditions for additional projects. Therefore, the Proponent should provide, in the SEIR, an understanding of where and when this approach may be transferable to other locations and how it may be applied for the project to successfully serve as a pilot for other salt marsh restoration projects.

Procedural History

The Proponent filed an EENF in May 2019 for the original pilot project that proposed restoration of approximately 85 acres of salt marsh within the Old Town Hill Reservation (EEA#16033). The original pilot project was intended to address the impacts of historic agricultural and mosquito control ditches that have interfered with natural tidal drainage and resulted in water logging of the peat substrate, subsidence of the marsh, and loss of vegetation. The restoration approach sought to encourage re-vegetation by creating conditions that would allow natural processes to restore elevation of the salt marsh and vegetation over time without ongoing intervention. Specifically, the Proponent would hand-mow, collect, loosely braid, and secure bundles of salt marsh hay to the bottom of pre-selected ditches in the marsh (ditch remediation technique). This technique slows tidal flow, encourages the deposition of sediment from the water column, and facilitates accelerated peat development and revegetation by native salt marsh species, particularly *Spartina alterniflora*. Upon completion of the project, tidal flow would be directed to the untreated ditches, identified as primary channels. The increased rate of flow in the primary channels would bring the site closer to the single-channel hydrology of a healthy and resilient salt marsh. The original pilot project also included the hand removal of small clogs within identified primary channels (up to four feet in length) to minimize the potential that flow will be diverted around the blockages, causing unnecessary erosion of the marsh plain. The original project proposed treating 138 auxiliary ditches (once a year for three years) and reopening nine small blockages to encourage flow. Proposed post-restoration monitoring included an evaluation of vegetative cover using one square meter plots in transects along a select sampling of both treated and untreated ditches. Success of the ditch remediation restoration technique would be measured by the establishment of native salt marsh vegetation on the ditch bottoms. The goal of the project was to reverse the trend of salt marsh subsidence, re-establish and maintain high marsh habitat, support native obligate marsh species, and improve coastal resiliency to address sea level rise. The Proponent developed the project with the support of numerous state, local, and federal agencies and non-profit organizations. The DER selected the project as a “Priority Project” in a competitive review of solicited proposals, based on the breadth of its ecological benefits.

The EENF (EEA#16033) included a request for a full waiver of the mandatory EIR. The Certificate on the EENF was issued on June 28, 2019 and a Final Record of Decision (FROD) was issued on July 26, 2019 that granted a waiver from the requirement to prepare a mandatory EIR for the

original pilot project. The original pilot project obtained all permits and approvals at the end of 2019, which delayed the expected start of implementation of ditch remediation from fall of 2019 to the first neap tide cycles in May 2020. Further delays this spring were attributed to adverse weather and quarantining associated with COVID 19. As treatment proceeds through the 2020 growing season, it is expected that some refinement and efficiencies of technique will be developed which will be inform implementation at the other sites. Since work will not be completed until the fall of 2020[1], post-treatment vegetation and elevation monitoring data collection will not start until the six-week tidal cycle in spring/summer of 2021 and this monitoring data is not expected to be available until summer of 2021.

Expansion of Pilot Project

The ExNPC and EENF reviewed in this Certificate, along with supplemental information provided to the MEPA Office on June 15, 2020, describe the Proponent's intention to expand the previously permitted pilot project in Newbury that is currently underway to include additional areas in Newbury, Essex and Ipswich.[2] If successful, this expanded pilot project may restore up to 378 acres of salt marsh in the Great Marsh Area of Critical Environmental Concern (ACEC). In addition to the techniques used in the original pilot project, the expanded pilot project proposes an additional pilot technique called runneling, which involves the construction of swales/ditches to direct surface tidal water to the new ditches, to encourage peat formation and eventual revegetation of the ditch with salt marsh grasses.

The ExNPC proposes activities to restore salt marsh within 50 additional acres in the adjacent William T. Forward Wildlife Management Area (WMA) in Newbury, which is owned and managed by the Massachusetts Division of Fisheries and Wildlife (DFW). Ditch remediation is proposed for 62 out of a total of 102 ditches within the expanded Newbury site. The project will reopen 17 small blockages. Micro-runnels are proposed at seven locations in the expanded Newbury site.

The EENF proposes restoration of 243 acres of salt marsh within the Great Marsh ACEC, including 132 acres at the Crane Reservation in Ipswich and 111 acres in the Crane Wildlife Reservation and adjoining Stavros Reservation in Essex, which are both owned and managed by the Proponent. Ditch remediation is proposed for 218 out of a total of 332 ditches within the Ipswich site and for 225 out of a total of 335 ditches within the Essex site. The project will reopen small blockages (21 in Ipswich and nine in Essex). Micro-runnels are proposed in two locations in Ipswich and two in Essex.[3]

The projects in Ipswich, Essex, and the expanded area in Newbury are considered an expansion of the initial pilot in Newbury that will test the ditch remediation technique over a broader range of tidal conditions in different areas of the Great Marsh. The hydro-period for each project area differs based on slope, elevation, and proximity to the ocean. In addition, the expanded areas provide an opportunity to introduce a secondary restoration technique to the pilot program of overall adaptive ditch management strategy, specifically the use of micro-runnels and the formation of bird islands from the resulting marsh sod. Micro-runneling is proposed to address targeted areas where more advanced subsidence has

[1] Visual monitoring will be ongoing during fall of 2020 to spring of 2021 to facilitate any necessary adjustments.
[2] For purposes of clarity, this supplemental information is referred to herein as the ExNPC or the EENF, unless otherwise referenced.
[3] According to the supplemental information, the Essex site originally had four runnels proposed for a total of 489 lf. Two runnels have been eliminated since filing the EENF and the total is currently proposed at 189 lf.

occurred. This process consists of creating shallow linear swales to restore drainage in areas that once contained natural channels that were eliminated as part of past agricultural practices or are unrecoverable due to subsidence. According to the ExNPC and EENF, this technique is proposed to expedite a natural process to break down mega-pools created by historic agricultural and mosquito control uses by encouraging tidal flows, drainage, peat formation, and eventual revegetation of the ditch with salt marsh grasses. The project also proposes to incorporate additional wildlife habitat enhancement by re-using the excavated marsh sod collected during runnel construction to create small nesting areas of high marsh to benefit saltmarsh sparrow (*Ammodramus caudacutus*), a state-listed rare species. The supplemental information indicates that the project design for these areas has been developed with careful attention to site specific conditions, and that other combinations of restoration techniques may be more applicable in other locations.

Project Site

The additional 50-acre project area in Newbury described in the ExNPC (EEA#16033) is located at the William T. Forward WMA. It extends around Kent's Island from the upland edge to the banks of the Little River along the south and eastern portion of the site and to the north and west. The Little River, tributary to the Parker River, winds through the site as it does within the original project area. Previous salt marsh restoration efforts have been conducted at the project site, including the completion of the new Kent's Island bridge which eliminated a tidal obstruction and severe erosion at the site of the old culvert, enabling restoration of 47 acres of salt marsh. Despite these improvements, changes to the drainage of large sections have led to changes in the extent and type of vegetation within the marsh, created large areas of mud flats and interconnected pools, and converted areas from high marsh (i.e. *Spartina patens)* to low marsh (i.e. *Spartina alterniflora).* Within the additional project area, there are a total of 161 historic agricultural embankment signatures and 102 ditches. This is in addition to the 51 agricultural embankments and 219 ditches in the original project.

The 243-acre project site described in the EENF (EEA#16210) includes two separate locations at Crane Reservation in Ipswich and the Crane Wildlife Reservation in Essex. The 132-acre Ipswich site includes salt marsh to the east and west side of Argilla Road at the approach to the Crane Beach parking area. This site contains 150 historic agricultural embankments and 229 ditches associated with former agricultural and mosquito control activities. Both the western and eastern marsh sections have experienced excessive historic ditching, and vegetation loss is readily observable especially in the western section near Argilla Road. The unmaintained historic ditches have changed the extent and type of vegetation within the marsh, created large areas of mud flats and interconnected pools, and converted areas from high marsh (i.e. *Spartina patens)* to low marsh (i.e. *Spartina alterniflora).* The Proponent, with funding from the Massachusetts Office of Coastal Zone Management (CZM), is currently in the design phase of a project (EEA#16227) to elevate Argilla Road and potentially address tidal restrictions in the area.[4] The proposed ditch remediation work is expected to compliment, rather than interfere with, planned resiliency measures for the roadway.

The 111-acre Essex site is located approximately one mile south of the Ipswich site and is located within the Crane Wildlife Refuge with a small portion in the southwest within the Stavros Reservation. This site contains 110 historic agricultural embankments, 85 naturalized tidal channels and

[4] The Argilla Road Adaptation Project was published in the June 10, 2020 edition of the *Environmental Monitor* and is currently undergoing MEPA review.

310 ditches. There are few roads or culverts in this area to interfere with tidal exchange. However, the ditch network is complicated and excessive ditching is believed to have contributed to subsidence at this location. The site was selected due to its inclusion in CZM's Tidal Marsh Sentinel Site Program, which was developed to collect and analyze data to inform management of sensitive coastal locations. The site also represents a good example of a platform marsh, or a marsh that is located a significant distance from shore, and provides an opportunity for restoration to protect the John Wise Avenue causeway, which is the only means of accessing Lowe Island.

Wetland resource areas within the project areas include Salt Marsh, Riverfront Area (RFA), and Land Subject to Coastal Storm Flowage (LSCSF). The site is located within the designated Great Marsh ACEC, which is also an Outstanding Resource Water (ORW). The project site is located in *Priority* and *Estimated Habitat* as mapped by DFW's Natural Heritage and Endangered Species Program (NHESP). According to the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (FIRM), the project site is located within the designated 100-year floodplain (Zone AE).

Environmental Impacts and Mitigation

Potential environmental impacts are associated with the alteration of wetland resources, a necessary component of a salt marsh restoration project. The entire project site is within the Great Marsh ACEC. The original project in Newbury would directly impact 14.2 acres of salt marsh and LSCSF, and 8.57 acres of RFA, and alter the hydrology of 85 acres of salt marsh. The expanded area in Newbury will directly impact an additional 6.2 acres of salt marsh and LSCSF and alter the hydrology of 50 additional acres of salt marsh. At the Ipswich site, the project will directly impact 42,075 square feet (sf) of salt marsh and LSCSF and 14,726 sf of RFA and alter the hydrology of 132 acres of salt marsh. At the Essex site, the project will directly impact 49,911 sf of salt marsh and LSCSF and 24,546 sf of RFA and alter the hydrology of 111 acres of salt marsh. These restoration projects collectively will alter the hydrology of a total of 378 acres of Salt Marsh.

Measures to minimize construction period impacts include the following: conducting work during low tide cycles, voluntary adherence to time-of-year (TOY) restrictions for mowing activities, and selection of a restoration method that does not require use of any heavy equipment and is reversible in the event of unforeseen outcomes. A comprehensive monitoring program will build on data collected in prior pilot projects and in this salt marsh system to gauge the efficacy of restoration efforts.

Jurisdiction and Permitting

The project is subject to MEPA review and preparation of a mandatory EIR pursuant to 301 CMR 11.03(3)(a)(1)(a) and 301 CMR 11.03(3)(a)(1)(b) because it requires State Agency Actions and involves alteration of one or more acres of Salt Marsh and alteration of ten or more acres of any other wetlands (LSCSF and RFA). It also exceeds the ENF threshold at 301 CMR 11.03(11)(b) as it involves a project within a designated ACEC. The project will require a Chapter 91 (c. 91) License and 401 Water Quality Certification (WQC) from the Massachusetts Department of Environmental Protection (MassDEP) and review by NHESP.

The project requires an Ecological Restoration Order of Conditions from the Conservation Commissions for Newbury, Ipswich and Essex (or in the case of an appeal, a Superseding Order of

Conditions from MassDEP), submittal of a Pre-Construction Notification (PCN) to the U.S. Army Corps of Engineers (ACOE), and Federal Consistency Review from CZM.

Funding and technical assistance will be provided from DER and DFW. Because the project is receiving State Financial Assistance, MEPA jurisdiction is broad in scope and extends to all aspects of the project that may cause Damage to the Environment, as defined in the MEPA regulations.

Waiver Request

In accordance with Section 11.05(7) of the MEPA regulations, the Proponent submitted an ExNPC and EENF with a request that I waive the requirement for a mandatory EIR. The ExNPC and EENF included a discussion of the project consistency with the waiver criteria outlined at 310 CMR 11.11 and was subject to an extended comment period pursuant to Section 11.06(1) of the MEPA regulations. The Waiver request was discussed at the consultation session for the project.

Single EIR Request

The Proponent has also requested, in the event a full Waiver is denied, that it be allowed to submit a Single EIR in lieu of Draft and Final EIRs. The MEPA regulations at Section 11.06(8) indicate that a Single EIR may be allowed, provided that the EENF: a) describes and analyzes all aspects of the project and all feasible alternatives, regardless of any jurisdictional or other limitation that may apply to the Scope; b) provides a detailed baseline in relation to which potential environmental impacts and mitigation measures can be assessed; and, c) demonstrates that the planning and design of the Project use all feasible means to avoid potential environmental impacts.

Review of the EENF

The ExNPC and EENF include an alternatives analysis, identify baseline environmental conditions and potential environmental impacts, and propose mitigation measures to justify the request for a Single EIR. However, as reflected in comment letters from MassDEP and CZM, the Proponent has yet to demonstrate the full efficacy of the pilot techniques for salt marsh restoration described in these proposals. In particular, they introduce a new technique (micro-runneling) that was not proposed in the original pilot project, and do not clearly set forth standard protocols that would govern future restoration efforts or metrics for measuring success and efficacy in a manner that would clearly inform the parameters of future activities. Notwithstanding the overall design and intent of the projects to promote ecological restoration and protection, I therefore cannot find that the proposed measures are likely to have “no Damage to the Environment” as is required to issue a full waiver of the EIR under 301 CMR 11.11(3)(a). Further analysis of impacts is warranted in an SEIR.

CZM comments indicate that an understanding of the results of this pilot project on a landscape level is critical to evaluate the effectiveness of this innovative restoration technique and to assess potential unintended impacts to the marsh and any adjustments to the approach which may be needed as part of adaptive management. Accordingly, additional proposals to use this restoration technique beyond the currently proposed expanded pilot project areas should be contingent on demonstration of the success of this pilot in meeting the stated landscape level restoration goals, and the criteria for determining success at this level should be clearly specified.

Based on review of the ExNPC and EENF and consultation with State Agencies, I hereby allow the Proponent to submit an SEIR in lieu of a Draft and Final EIR. The Proponent should submit a SEIR that provides updated project information and analyses as specified in the Scope below.

SCOPE

General

The SEIR should follow Section 11.07 of the MEPA regulations for outline and content, as modified by this Scope.

Alternatives Analysis

The ExNPC/EENF includes an evaluation of the following alternatives: No Action, Thin Layer Deposition (TLD); Filling of Ditches; Open Marsh Water Management (OMWM)/Open Water Marsh Management (OWMM); Removal of Tidal Obstructions; Accommodating Salt Marsh Migration; and the Preferred Alternative (as described herein). The No Action Alternative was dismissed as it would continue the pattern of vegetation loss and marsh subsidence, which will negatively impact the natural functions of the Great Marsh. The TLD Alternative would place a layer of compatible sediment over the marsh to increase its elevation. The Filling of Ditches Alternative would install earthen plug dams and/or backfill select ditches with compatible sediment. The TLD and Filling of Ditches Alternatives were dismissed as they would require the use of heavy equipment on the marsh and may introduce invasive species, increase downstream turbidity and sedimentation, and result in a temporary loss of wetland functions. The use of ditch plugs has also been shown to be unsuccessful in prior restoration efforts, and in some cases, these plugs are now being removed. The OMWM/OWMM Alternative would selectively excavate ponds and ditches to improve tidal flow and access for predatory fish to control mosquito eggs and larvae. This alternative was dismissed as it may accelerate waterlogging and marsh subsidence. The ExNPC indicates that the Removal of Tidal Obstructions Alternative was dismissed as previous tidal obstructions at and near the Newbury site have already been addressed. The EENF indicates that Removal of Tidal Obstructions Alternative was dismissed as previous tidal obstructions at the Ipswich site were addressed through replacement of the Fox Creek Bridge; as noted, further infrastructure improvements to Argilla Road are currently being considered in partnership with CZM. The Essex site does not contain any significant man-made tidal obstructions.

The Accommodating Salt Marsh Migration Alternative would seek to acquire upland properties for conservation purposes to accommodate migration of the salt marsh and prevent loss due to inundation from sea level rise. This alternative was dismissed due to the cost and logistics involved in moving existing development and infrastructure; in addition, the Proponent already owns bordering conservation land near the Ipswich and Newbury sites, and the Essex site is located mostly within the Essex river estuary with no land migration options. The marsh at the Newbury site's high elevation in the tidal range makes further migration unlikely and if subsidence continues, there is a risk that there will be no viable marsh left to migrate.

The Preferred Alternative proposes a less impactful technique for salt marsh restoration based on hand mowing and subsequent placement of salt marsh hay into treated ditches by hand or blower to depths of eight to nine inches. This restoration strategy is proposed for 138 ditches as part of the original pilot project, and 62 ditches in the expanded Newbury site, 218 ditches in Ipswich, and 225 ditches in Essex. Within as early as one growing season, some ditch bottoms are expected to become fully vegetated as salt marsh grass becomes established and serve to bind new peat layers to the surrounding marsh. In addition, the ExNPC and EENF identify 56 discrete locations where small blockages or clogs in untreated primary channels will be opened (up to four feet) using hand tools to encourage flow. The project also proposes micro-runneling involving excavation of shallow linear swales (four to six inches deep by 1.5-2.5 feet wide) using a low ground pressure (2.3 pounds per square inch (psi)) track loader to connect the swales to adjacent primary ditch channels. The project proposes seven micro-runnel locations at the expanded Newbury site (1,915 lf), two in Ipswich (278 lf), and two in Essex (189 lf). Excavated material will be transferred to a nearby area to create nesting habitat for saltmarsh sparrow.

According to the ExNPC and EENF, the Preferred Alternative was selected as it can be implemented with minimal use of heavy equipment, does not result in any loss of wetland function, and is entirely reversible in the event of unintended consequences. However, in recognition of the fact that the proposed techniques are still considered pilot methods, the project proposes a comprehensive monitoring protocol to ensure that data collected through this effort can inform future restoration projects. Specifically, the project establishes the presence of salt marsh grass (*Spartina alterniflora*) within treated ditch bottoms as an initial indicator of successful restoration. Additional monitoring of the marsh plain between treated ditches will be conducted, and pre-and post-treatment monitoring of ditches will include tracking the elevation of the ditch bottoms and surface elevation transects based on permanent benchmarks to be established prior to treatment. Detailed vegetation monitoring will be conducted, and follow-up treatment may need to be completed annually. Supplemental information indicates that all techniques proposed, including micro-runneling, are reversible in the event collected data suggests that the techniques are not successful or are leading to unintended consequences.

Supplemental information indicates that runneling is proposed as part of the expanded pilot project specifically to restore sections of historic natural tidal channels where present conditions indicate subsidence has occurred or is likely and a mega-pool trajectory has begun. The purpose of the proposed runnels is to intercept the mega-pool trajectory before pool formation by creating the breach which will allow the area to advance it to the secondary successional stage where revegetation occurs. Although the breach cycle would naturally occur in intervals of approximately 40 years, based upon past rates of sea level rise, it is expected that substantial additional subsidence would occur based on the increased rate of sea level rise. This subsidence may significantly and potentially irreversibly impair the ability of the marsh to keep up with rising sea levels and in turn its ability to provide its natural flood control and storm damage protection functions and its value as wildlife habitat.

The SEIR is required to provide additional information to demonstrate that runneling will not produce unintended consequences as further described below. The SEIR should consider an alternative that does not involve runneling techniques and identify how elimination of the runnels would change any portion of the design proposed in the ExNPC and EENF.

Wetlands, Waterways, Water Quality

While the project is proposed to improve the overall ecosystem functions of the site on a long-term basis, it will result in unavoidable impacts to wetland resource areas (Salt Marsh, RFA, and LSCSF). The project is proposed as an Ecological Restoration Project (ERP) pursuant to 310 CMR 10.13. The Newbury, Ipswich and Essex Conservation Commissions will review the project to determine its consistency with the Wetlands Protection Act (WPA), the Wetlands Regulations (310 CMR 10.00), and associated performance standards. The ExNPC and EENF include a description of the project's consistency with the applicable WPA performance standards and the eligibility criteria for a Restoration Order of Conditions (310 CMR 10.13). MassDEP will review the project to determine its consistency with the Waterways Regulations (310 CMR 9.00) and the 401 WQC regulations (314 CMR 9.00).

MassDEP comments opine that the project is not permittable under the WPA and that a Variance would be required. The SEIR should expand on how all components of the project (including the runneling) qualify as a Limited Project or how the project meets the criteria for a Variance from the Wetlands Regulations. Should the project require a Variance, the Single EIR should describe the process for seeking a Variance, address how the project meets the criteria for a Variance provided in 310 CMR 10.05(10), and include a discussion of the public interests that the project intends to advance in seeking a Variance. The Proponent is required to consult with the MEPA Office, MassDEP and CZM, prior to the submission of the SEIR to ensure that the filing is responsive to the Scope and comments on the ExNPC and EENF.

The SEIR should clearly provide an updated impact analysis that summarizes direct impacts for each project site and include a breakdown of impacts in a narrative and tabular format associated with treatment of ditches through placement of the mowed hay, clearing of identified clogs, mowing of vegetation, excavation of micro-runnels, and creation of nesting islands. The SEIR should include a detailed breakdown of temporary impacts to wetland areas in a narrative and tabular format.

The project's goals include restoration of salt marsh degraded by anthropogenic influences through re-establishment of natural flow, sedimentation and re-vegetation processes, and the management of declining salt marsh sparrow habitat. MassDEP comments indicate that although the ditch remediation technique is relatively new, it is an innovative approach that has been found to be successful at smaller scales in other locations, with no adverse impacts to marsh vegetation or function. The original pilot project was supported by MassDEP as it met the criteria of an Ecological Restoration Limited Project under the WPA. The expanded pilot project is proposed to demonstrate the efficacy of this approach (ditch remediation at a larger scale than previous efforts and the addition of micro-runnelling and bird islands) as a restoration strategy at the landscape level.

MassDEP and CZM comments indicate their support for the Proponent's research goals and work associated with understanding how to protect the long-term health of the Great Marsh and facilitate its ability to respond to climate change impacts, including sea level rise. However, MassDEP and CZM comments express concern regarding the lack of data to support the Proponent's conclusions that micro-runneling will not result in an alteration and will improve salt marsh functions, as well as improve habitat for the salt marsh sparrow. Comments also indicate that the expansion of the areas for ditch remediation treatment seems premature without additional data to support its use. Therefore,

MassDEP and CZM do not support the Waiver Request based on the amount of direct impacts to marsh through removal and filling activities associated with micro-runneling and because the proposed techniques have either not been tested in Massachusetts or have previously been used only at small-scale research sites; data collection from this project may inform the design and implementation of similar projects throughout the coastal zone; and additional information is required to ensure that the project is consistent with CZM enforceable coastal policies.

I refer the Proponent to the detailed comments and recommendations from CZM, particularly with regard to future monitoring, the metrics to be applied, and mechanisms, financial and otherwise, to ensure that any impacts from proposed techniques can be fully and promptly mitigated. In the SEIR, the Proponent should develop the additional details and information in direct response to CZM comments to continue to gather data about protecting the Great Marsh and gain insight about possible responses to sea level rise and climate change. The Proponent should develop a written protocol for the identification of appropriate project sites, survey requirements for feature mapping, ditch and channel selection for remediation, pre- and post-monitoring needs, specific physical restoration methods, and likely maintenance and adaptive management needs to ensure the process can be replicated by others where appropriate. This initial protocol may require amendment to reflect the findings from longer term monitoring and management over time and with additional data.

The Proponent emphasizes the need for adaptive management to ensure that modifications continue to function as designed; however, the monitoring plan indicates that only eight to ten percent of the remediated ditches are proposed for pre- and post-monitoring. The SEIR should describe the monitoring methodology for additional modifications, as well as the 90 percent of ditches not identified for pre- and post-monitoring, for maintenance needs and adaptive treatment. CZM comments emphasize the importance that the Proponent maintains the ability to appropriately monitor and address issues as they arise to ensure that the restoration goals are met for all treated areas in the expanded pilot project.

According to the ExNPC and EENF, the restoration effort is weighted heavily on careful pre-treatment observations and assessment and post-construction monitoring to measure success. The SEIR should specifically describe how observation and monitoring of these expanded areas will be achieved. The ExNPC and EENF indicate that the restoration that will occur will be gradual and that further research is required to determine whether the increase in vegetation and sediment deposition will continue on its own or require further intervention and whether it will achieve the desired result of stemming the rate of subsidence. However, tracking and monitoring for the project is only proposed for years 1 and 2 following treatment (to 2022). Additional monitoring of marsh plain between treated ditches will also be conducted for long-term research into the ability of the treatment to successfully mitigate on-going marsh subsidence, including observations of marsh plain elevation and vegetation changes toward a more sustainable high salt marsh plant community. The SEIR should provide additional detail on longer-term monitoring and Tier 4 of this approach, which includes adaptive management of the project sites. The SEIR should include a plan which outlines the ability to monitor the restoration actions over the long term, including how they will be monitored and by whom, what metrics will trigger adaptive management actions on-site (and when and how those will be applied), and what measures will be taken to reverse actions taken by the Proponent if impacts are seen over time beyond the two-year implementation period.

The SEIR should provide additional quantitative data on the baseline conditions of the marsh

system at the project sites to support conclusions made in the ExNPC and EENF regarding current indicators of salt marsh health, including evidence of changes in vegetation, conversion of areas previously dominated by *Spartina patens* to *Spartina alterniflora* dominance, changes in salt marsh elevation due to subsidence, and expanded areas of marsh transitioning to unvegetated or sparsely vegetated mudflats. The SEIR should provide additional information regarding the metrics that have been and will be collected for monitoring of baseline conditions prior to project implementation to quantify the impacts (both beneficial and adverse)of proposed restoration techniques on the marsh system to better understand the rationale for site selection at the expanded locations.

Comments from the Division of Marine Fisheries (DMF) emphasize the importance of monitoring during and after restoration treatments and request the Proponent provide project updates once restoration activities have commenced. The SEIR should discuss pre-monitoring of areas to be drained to understand potential impacts, if any to submerged vegetation, based on the observation of *Ruppia maritima* at the Essex site, which may occur elsewhere in pannes and pools. The SEIR should address monitoring and maintenance of new opened areas, where clogs within the channels are removed to avoid impacts from this activity. The SEIR should provide standard operating procedures which outline practices to avoid the transfer of invasive species on equipment, machinery, and hay from outside sources.

The SEIR should provide relevant data references and a rationale to support the use of marsh islands to improve salt marsh sparrow habitat and runnels to improve marsh condition. The SEIR should provide a discussion of potential impacts of these techniques. The supplemental information indicated the Proponent, if required by permitting agencies, would provide a performance bond to conduct any mitigation that may be required due to unintended consequences of the project. I encourage the Proponent to incorporate the provision of a performance bond or escrow account as a mitigation commitment. The SEIR should provide an additional description of the funding mechanism, including a rational for and identification of the funding amount.

The SEIR should provide more detail on how the target depth of four to six inches for runnels will be ensured and measured, and how these areas will be tracked over time to: measure whether the goals of revegetation and reverse subsidence are met; monitor for unintended consequences including subsidence if the runnel soils and waterlogged areas become exposed to oxygen, or erosion within the runnel once flow is established; develop a plan to reverse or mitigate these impacts; and maintain and monitor the runnel area over time in case of blockages.

The project proposes to create a total of 47 nesting islands with an average size of approximately 80-100 sf for a maximum of 4,700 sf (23 in Newbury, seven in Ipswich and 17 in Essex). The SEIR should provide more detail and information on site selection for the placement of the marsh islands, how and if they will be secured, what monitoring will occur to detect salt marsh sparrow use of these areas, and a monitoring and maintenance plan for both meeting the goals of the project and also for mitigating any unintended impacts (i.e. vegetation changes, subsidence from underlying vegetation decomposition if placed on the vegetated marsh platform, failure of the “marsh island” to establish, etc.).

As previously indicated, portions of the Crane Marsh site in Ipswich are directly adjacent to the ongoing Argilla Road elevation project (EEA#16227), which will have direct impacts on this portion of the salt marsh. The SEIR should include an evaluation of the relationship and interaction between the

two projects to provide a better understanding of how the Argilla Road project may affect or intersect with the expanded pilot project, particularly in terms of changes to delineated tide sheds, microtopography, and hydrology, and how those changes may require modifications to the design parameters of the pilot project in the affected areas.

Rare Species

The project site in Newbury is mapped as *Priority* and *Estimated Habitat* for the Eastern Whip-poor-will (*Antrostomus vociferus*) and the project sites in Ipswich and Essex are mapped as *Priority* and *Estimated Habitat* for the Common Tern (*Sterna hirundo*) and Least Tern (*Sterna antillarum*) according to the Massachusetts Natural Heritage Atlas (14th Edition). These species and their habitat are protected pursuant to the Massachusetts Endangered Species Act (MESA; MGL c.131A) and its implementing regulations (321 CMR 10.00). NHESP comments indicate that it anticipates that the project will likely qualify for the habitat management exemption from the MESA review process pursuant to 321 CMR 10.14(15) as "the active management of State-listed species habitat…for the purpose of maintaining or enhancing the habitat for the benefit of rare species" carried out in accordance with an approved habitat management plan. The Proponent will be required to submit the habitat management plan to NHESP for formal review and approval prior to initiating work. NHESP comments also recommend that this plan include a timing restriction on work between May 15 and August 31 on the Ipswich and Essex sites to avoid disruption to foraging and nesting activities of state-listed terns. The SEIR should confirm that the project will adhere to this TOY restriction. The SEIR should provide an update on any consultation with NHESP.

Climate Change and Resiliency

The protection and restoration of wetlands plays an increasingly important role in promoting ecosystem resiliency and mitigating climate change impacts. Revegetating these ditches is proposed to reverse the trend of salt marsh subsidence and enhance its ability to reduce wave energy and absorb storm surge in the face of sea level rise. The Towns of Newbury, Ipswich, and Essex have been designated as participating communities in the Commonwealth's Municipal Vulnerability Preparedness (MVP) program which provides support for the process of planning for climate change resiliency and implementing priority projects. Through the MVP program, the Towns received funding to conduct a planning process for climate change resiliency and implementing priority projects. The results of the initial community-driven process were presented in separate municipal reports which indicated that the restoration of the Great Marsh was a common theme during community discussions and it was identified as a high priority action to improve resiliency. Through the MVP Program, the Towns will have access to technical support and funding for project implementation.

The SEIR should discuss how the project will further climate resiliency, including future flooding and increased impacts to salt marsh in the absence of restoration due to the effects of sea level rise. The SEIR should confirm the use of the best available data of sea level rise and precipitation levels. To the extent feasible, the SEIR should quantify the carbon sequestration benefits that proposed salt marsh restoration will have, as compared to potential loss due to the effects of climate change. The Blue Carbon Calculator, available at https://www.mass.gov/service-details/use-the-blue-carbon-calculator, may be a tool that could be used for this purpose. The SEIR should also demonstrate that there will not be any secondary effects that would be exacerbated due to this effort, such as the interaction between

this project and the effort to raise Argilla Road (that intersects part of the project site) for resiliency reasons.

Greenhouse Gas (GHG) Emissions

This project is subject to review under the May 2010 MEPA Greenhouse Gas (GHG) Emissions Policy and Protocol ("the Policy") because it exceeds thresholds for a mandatory EIR. The GHG Policy specifically includes a de minimis exemption for projects that are expected to produce minimal GHG emissions. This is an ecological restoration project that is designed to restore natural processes and provide critical high-marsh habitat for state-listed and at risk species. Equipment is limited to a push mower and a 2.3-psi track loader. As such, the project falls under the GHG Policy's de minimis exemption and the Proponent is not required to prepare a GHG analysis.

Construction Period

The SEIR should provide an update on construction activities and methodologies. Restoration activities are anticipated to commence in the fall of 2020 and will proceed through early winter. Work will occur during low tide cycles. A push mower will mow a swath of salt marsh located parallel to the treatment ditch. The salt marsh will be braided and placed into the ditch to a maximum depth of nine inches. A small portion of the project may be treated with salt hay from a locally sourced salt marsh farmer. Small wooden stakes and biodegradable twine will secure the hay to the bottom of the ditch. Following the initial treatment, additional treatment of deeper ditches may occur in 2021 and 2022. Fifty-six blockages caused by peat collapsing into primary channels will be reopened using hand tools to encourage tidal flow. Micro-tunneling will involve the creation of shallow swales using a low ground pressure (2.3 psi) track loader to connect the swales to adjacent primary ditch channels.

All construction should be managed in accordance with applicable MassDEP's regulations regarding Air Pollution Control (310 CMR 7.01, 7.09-7.10), and Solid Waste Facilities (310 CMR 16.00 and 310 CMR 19.00, including the waste ban provision at 310 CMR 19.017). The project should include measures to reduce construction period impacts (e.g., noise, dust, odor, solid waste management) and emissions of air pollutants from equipment, including anti-idling measures in accordance with the Air Quality regulations (310 CMR 7.11). I encourage the Proponent to require that its contractors use construction equipment with engines manufactured to Tier 4 federal emission standards, or select project contractors that have installed retrofit emissions control devices or vehicles that use alternative fuels to reduce emissions of volatile organic compounds (VOCs), carbon monoxide (CO) and particulate matter (PM) from diesel-powered equipment. Off-road vehicles are required to use ultra-low sulfur diesel fuel (ULSD). If oil and/or hazardous materials are found during construction, the Proponent should notify MassDEP in accordance with the Massachusetts Contingency Plan (310 CMR 40.00). All construction activities should be undertaken in compliance with the conditions of all State and local permits.

According to the Massachusetts Board of Underwater Archaeological Resources (BUAR), no submerged archaeological resources are known to exist at the project site, although the area is generally archaeologically sensitive. Therefore, if archaeological resources are encountered during the course of the project, the Proponent should take steps to avoid or limit adverse impacts and notify BUAR, the Massachusetts Historical Commission (MHC), and other appropriate agencies in accordance with BUAR's *Policy Guidance for the Discovery of Unanticipated Archaeological Resources*.

Mitigation and Draft Section 61 Findings

The SEIR should include a section that summarizes proposed mitigation measures and provides draft Section 61 Findings for each State Agency Action. The SEIR should contain clear commitments to implement these mitigation measures (including any monitoring), estimate the individual costs of each proposed measure, identify the parties responsible for implementation, and contain a schedule for implementation.

Responses to Comments

The SEIR should contain a copy of this Certificate and a copy of each comment letter received. In order to ensure that the issues raised by commenters are addressed, the SEIR should include direct responses to comments to the extent that they are within MEPA jurisdiction. This directive is not intended, and shall not be construed, to enlarge the scope of the SEIR beyond what has been expressly identified in this certificate.

Circulation

The Proponent should circulate the SEIR to those parties who commented on the EENF (EEA#16033), the ExNPC (EEA#16033), the EENF (EEA#16210), to any State Agencies from which the Proponent will seek permits or approvals, and to any parties specified in section 11.16 of the MEPA regulations. A copy of the SEIR should be made available for review at the Newbury, Ipswich, and Essex Public Libraries.[5]

K. Theoharides

July 17, 2020
Date

Kathleen A. Theoharides

Comments received on both EEA#16033 and EEA#16210, if not otherwise indicated:

05/28/2020	Natural Heritage and Endangered Species Program (NHESP) (EEA#16210)
06/09/2020	NHESP (EEA#16033)
06/19/2020	Massachusetts Division of Ecological Restoration (DER)
06/19/2020	Massachusetts Division of Marine Fisheries (DMF) (EEA#16210)
07/02/2020	Massachusetts Office of Coastal Zone Management (CZM)
07/02/2020	Massachusetts Board of Underwater Archaeological Resources (BUAR) (EEA#16210)
07/06/2020	Massachusetts Department of Environmental Protection (MassDEP) – Northeast Regional Office (NERO)

KAT/PPP/ppp

[5] Requirements for hard copy distribution or mailings will be suspended during the Commonwealth's COVID-19 response. Please consult the MEPA website for further details on interim procedures during this emergency period: https://www.mass.gov/orgs/massachusetts-environmental-policy-act-office.

Massachusetts Department of Fish and Game
Division of Ecological Restoration
Invested in Nature and Community

Beth Lambert, Director
Hunt Durey, Deputy Director

Charles D. Baker
Governor
Karyn E. Polito
Lieutenant Governor
Kathleen A. Theoharides
Secretary
Ronald S. Amidon
Commissioner
Mary-Lee King
Deputy Commissioner

June 12, 2020

Secretary Kathleen A. Theoharides
Executive Office of Energy and Environmental Affairs
Attn: MEPA Office [via tori.kim@mass.gov & purvi.patel@mass.gov]
100 Cambridge Street, Suite 900
Boston, MA 02114

RE: EEA No. 16033 / Old Town Hill Salt Marsh Restoration – Newbury AND EEA No. 16210 / Great Marsh Restoration Phase II – Ipswich and Essex

Dear Secretary Theoharides:

The Division of Ecological Restoration (DER) continues to support the Trustees of Reservations' (Trustees) request for a waiver of the mandatory Environmental Impact Report (EIR) under 301 CMR 11.11(5) for the Notice of Project Change (NPC) relative to Old Town Hill Salt Marsh Restoration (EEA No. 16033) and the Great Marsh Restoration Phase II (EEA No. 16210) projects. DER agrees with the proponent that an EIR would result in undue hardship to the owner and that the project meets the EIR waiver requirements, including that an EIR would "not serve to avoid or minimize damage to the environment" and that "the project is likely to cause no damage to the environment".

The Trustees' projects collectively seek to pilot, monitor, and evaluate salt marsh restoration techniques within the Great Marsh ACEC that have recently been developed to address the legacy impacts of marsh plain ditching and impaired tidal hydrology. The Trustees is seeking to pilot these techniques across three distinct geographic locations within the Great Marsh ACEC. Although each implementation site is located within different municipalities (Newbury, Ipswich and Essex), these wetland habitats are functionally connected as part of the larger Great Marsh. The Ipswich and Essex locations will implement runneling techniques to re-establish surface tidal channels and restore impaired hydrology at these lower elevation sites. Piloting and monitoring of project outcomes will inform future restoration practitioners on the efficacy of nature-based use of salt hay and runnels to remediate the adverse ecological impacts of ditching across the elevation and habitat zonation gradients of the marsh system.

These efforts continue to be supported by project partners including DER and the U.S. Fish and Wildlife Service and involve academic partnership with UNH Jackson Marine Laboratory. These three projects have collectively received DER *Priority Project* status, and DER staff is participating on the technical team guiding design, permitting, and implementation.

The local, state, and federal permits required for this project will result in a thorough review by regulators and opportunities for public input. We appreciate this opportunity for input to the MEPA process. Please do not hesitate to contact me at (617) 626-1542 if you have questions about this letter.

Sincerely,

Beth Lambert
Director

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS
OFFICE OF COASTAL ZONE MANAGEMENT
251 Causeway Street, Suite 800, Boston, MA 02114-2136
(617) 626-1200 FAX: (617) 626-1240

MEMORANDUM

TO: Kathleen A. Theoharides, Secretary, EEA
ATTN: Page Czepiga, MEPA Office
FROM: Lisa Berry Engler, Director, CZM
DATE: July 2, 2020
RE: EEA-16033, Old Town Hill Salt Marsh Restoration; Newbury

The Massachusetts Office of Coastal Zone Management (CZM) has completed its review of the above-referenced Notice of Project Change (NPC), noticed in the *Environmental Monitor* dated May 20, 2020. The activities proposed to meet the stated goals of the project to restore salt marsh through re-establishment of natural flow, sedimentation and re-vegetation processes and the management of declining salt marsh sparrow habitat meet the categorical requirements for the preparation of an EIR. Because the proposed techniques have either not been tested in Massachusetts or have previously only been employed at small-scale research sites; data to be developed from this project may inform the design and implementation of similar projects throughout the coastal zone; and additional information is required to ensure that the project is consistent with enforceable coastal policies, CZM does not support the request for a waiver from the requirement for the preparation of an Environmental Impact Report (EIR). We look forward to working with the project proponents as the project develops and offer the following comments.

Project Description

The previously filed Expanded Environmental Notification Form (EENF) for the project proposed to restore salt marsh by encouraging re-vegetation of the historic ditch network within the project site, thereby restoring more natural drainage characteristics to the affected area of marsh. The ditch remediation technique involved harvesting marsh hay by hand-mowing swaths of marsh parallel to the ditches to be treated, or in some cases brought to the site from another locally hayed salt marsh. The mown hay is loosely braided and placed to depths of 8-9 inches within the pre-selected ditches, then secured with twine and wood stakes to the ditch bottom. The stated goal of this technique is to slow down tidal flow within the ditches to allow sediment to settle out of the water column and create a substrate for the establishment of native salt marsh vegetation, particularly *Spartina alterniflora.* The originally proposed project included a total of 138 auxiliary ditches for treatment, occurring once annually for three years. In addition, nine small blockages up to 4 feet in length, caused by slumping peat in primary channels, were proposed to be re-opened using hand tools to encourage flow. Proposed post-restoration monitoring included an evaluation of vegetative cover using 1 square meter plots in transects along a select sampling of both treated and untreated ditches. Success of the ditch remediation restoration technique would be measured by the establishment of native salt marsh vegetation on the ditch bottoms. The originally proposed project would directly impact 14.2 acres of salt marsh and land subject to coastal storm flowage (LSCSF) and 8.57 acres of riverfront area within the Great Marsh Area of Critical Environmental Concern (ACEC), and was anticipated to affect the hydrology of 85 acres of salt marsh. The NPC proposes additional activities within the adjacent William T. Forward Wildlife Management Area, owned and managed by Massachusetts Division of Fisheries and Wildlife, with the stated goal of helping the marsh restore itself, eliminating much of the present waterlogging conditions, and permitting natural accretion which will eventually lead to restoration of high marsh areas. According to the NPC, in addition to ditch remediation, a

supplemental restoration technique identified as "micro-runneling" is proposed at the expanded location to address targeted areas where more advanced subsidence has occurred. This process involves forming shallow (4-6-inch deep) linear swales approximately 1.5-2.5 feet wide to restore drainage in areas that once contained natural channels that were eliminated as part of past agricultural practices or are unrecoverable due to subsidence. The NPC states that these runnels would be constructed using a low ground pressure (2.3 psi) track loader. Material excavated includes primarily marsh sod, which is then proposed to be transplanted to the nearby high marsh platform to create small nesting islands as habitat for saltmarsh sparrow (*Ammodramus caudacutus*). The expanded area of restoration activity will directly impact an additional 6.2 acres of salt marsh and LSCSF within the ACEC to affect the hydrology of approximately 50 additional acres of salt marsh.

Project Comments

CZM is supportive of the project team's research goals and the important work of understanding how to protect the long-term health of the Great Marsh and facilitate its ability to respond to climate change impacts, including sea level rise. CZM has worked with the project partners toward these goals and continues to support opportunities to develop best management practices based on robust research.

As noted in previous comments on the original EENF, success of this large-scale pilot restoration technique may have implications for other restoration efforts within the Great Marsh and areas where the conditions may be similar, particularly where remnants of agricultural manipulations are present and impacting hydrology. According to the project team, this pilot project is being expanded to include the William T. Ford Wildlife Area described in this NPC and also separate areas in Essex and Ipswich, as described in a concurrently filed Expanded Environmental Notification Form (EEA#16210). Supplemental information provided to MEPA on June 15 clarifies that the Ipswich and Essex projects are considered part of the initial pilot to test the technique over a broader range of tidal conditions in different areas of the Great Marsh. In particular, the hydro-period for each project area differs due to slope, elevation, and proximity to the ocean. In addition, the expanded areas provide an opportunity to introduce a secondary restoration technique to the pilot program of overall adaptive ditch management strategy, specifically the use of micro-runnels and the formation of bird islands from the resulting marsh sod. The supplemental information states that the project design for these areas has been developed with careful attention to site specific conditions, and that other combinations of restoration techniques may be more applicable in other locations. For this project to successfully serve as a pilot for other salt marsh restoration projects, an understanding of where and when this approach may be transferable to other locations and how it should be applied is required. To ensure the process can be replicated by others where appropriate, the proponent should develop a written protocol for the identification of appropriate project sites, survey requirements for feature mapping, ditch and channel selection for remediation, pre- and post-monitoring needs, specific physical restoration methods, and likely maintenance and adaptive management needs. Over time and with additional data, the protocol may need to be amended to reflect the findings from longer term monitoring and management.

The NPC states that the project goals are to reverse the trend of salt marsh subsidence, re-establish and maintain high marsh habitat, support native obligate marsh species such as the at-risk salt marsh sparrow and to improve coastal resiliency in the face of sea level rise. By conducting the proposed ditch remediation at a larger scale than previous efforts, and with the addition of the micro-runnel technique, the goal is to demonstrate the efficacy of this approach as a restoration strategy at the landscape level. According to the NPC, the goal is to help the marsh restore itself, eliminating

much of the present waterlogging conditions, and permitting natural accretion which will eventually lead to restoration of high marsh areas. *Spartina alterniflora* established within the ditch bottom will serve as the initial indicator of successful restoration. While this indicates that the ditch remediation technique is successful, additional monitoring of the marsh plain between treated ditches will also be conducted as long-term research into the ability of the treatment to successfully mitigate the on-going marsh subsidence, including observations of marsh plain elevation and vegetation changes toward a more sustainable high salt marsh plant community. The supplemental narrative states that successful implementation will result in tidal exchange within the runnel and the interruption in the development of a mega-pool trajectory. The project team anticipates that, as monitoring information from this project combined with findings from the expanded sites in Ipswich and Essex are made available on the success of this restoration technique in the coming years, generalizations can be made as to its applicability under differing site conditions for additional projects. Based on these goals, an understanding of the results of this pilot project on a landscape level is critical to evaluate the effectiveness of this innovative restoration technique and to assess potential unintended impacts to the marsh and any adjustments to the approach which may be needed as part of adaptive management. Accordingly, additional proposals to use this restoration technique beyond the currently proposed expanded pilot project areas should be contingent on demonstration of the success of this pilot in meeting the stated landscape level restoration goals, and the criteria for determining success at this level should be clearly specified.

According to the NPC, the restoration effort is weighted heavily on careful pre-treatment observations and assessment and post-construction monitoring to measure success, but it is not clear from the filing how observation and monitoring of these expanded areas will be achieved. A total of 138 of the 219 ditches present in the expanded treatment area in Newbury are proposed for remediation. Additionally, seventeen locations within untreated primary channels with small blockages caused by slumping peat will be re-opened using hand tools to encourage flow without requiring the sediment to be removed or relocated, as was proposed in the initial treatment area. There are also seven micro-runnels proposed at the expanded site totaling 1,915 linear feet, which are proposed to be approximately 1.5 to 2.5 feet wide by approximately 4-6 inches deep. The excavated sod from each of these runnels is proposed to be transferred to nearby areas to create up to 23 high marsh microtopography "nesting islands" approximately 10 feet in diameter and 80 square feet in area, intended to support breeding habitat for saltmarsh sparrow. The NPC and the supplemental information provided during the MEPA review period stress the need for adaptive management to ensure that the modifications continue to function as designed, but the monitoring plan suggests that only a small percentage (8-10%) of the remediated ditch areas are proposed for pre- and post-monitoring. Permit documents should describe the monitoring methodology for the additional modifications, as well as the 90% of ditches not identified for pre- and post-monitoring, for maintenance needs and adaptive treatment. As the area proposed for treatment is expanded, it will be important to ensure that the capacity to appropriately monitor and address issues as they arise is maintained in order to ensure that the restoration goals are met for all treated areas.

The project proposal states that the restoration that will occur will be gradual and that further research is needed to determine whether the increase in vegetation and sediment deposition will continue on its own or require further intervention and whether it will result in stemming the rate of subsidence. However, tracking and monitoring for the project is only detailed for 2 years (to 2022). The document states that additional monitoring of the marsh plain between treated ditches will also be conducted for long-term research into the ability of the treatment to successfully mitigate the on-

going marsh subsidence, including observations of marsh plain elevation and vegetation changes toward a more sustainable high salt marsh plant community. More detail on longer-term monitoring and Phase 4 of this approach, which includes adaptive management of the project sites, is needed. Ideally, a plan would be developed detailing the capacity to monitor the restoration actions over the long term, including how they will be monitored and by whom, what metrics will trigger adaptive management actions on site (and when and how those will be applied), and what measures will be taken to reverse actions taken by the project team if negative impacts are seen over time beyond the 2 year implementation period.

The NPC provides conclusive statements about current indicators of salt marsh health, including evidence of changes in vegetation, conversion of areas previously dominated by *Spartina patens* to *Spartina alterniflora* dominance, changes in salt marsh elevation due to subsidence, and expanded areas of marsh transitioning to unvegetated or sparsely vegetated mudflats, adversely affecting the ability of the marsh to provide resiliency from coastal storms and rising sea level. The NPC provides only limited quantitative data on the baseline conditions of the marsh system project sites that leads to these conclusions. More detail of the metrics that have been and will be collected for pre-monitoring of baseline conditions so that the impacts of this technique on the marsh system (both beneficial and negative) can be quantified is needed to better understand the rationale for site selection at these expanded locations.

The NPC and supplemental documents state that this approach is relatively new and innovative, but the methods employed have been tested in other locations at a smaller scale and were found to be successful, with no adverse impacts. While references have been provided for ditch remediation, there is minimal information about the success of marsh islands for the goal to improve salt marsh sparrow habitat or for runnels to improve marsh condition, and the NPC does not provide any discussion of potential impacts of these techniques. The relevant data references and a discussion of how these support the use of these techniques should be provided. In addition, the establishment of a bond or escrow account to conduct any mitigation required due to the presence of adverse impacts should be provided.

As described in the NPC, runnels will be constructed using a low ground pressure (2.3 psi) track loader to form shallow 4-6 inch-deep swales to restore drainage. More detail should be provided on how the target depth will be ensured and measured, and how these areas will be tracked over time to:

(1) measure whether the goals of revegetation and reverse subsidence are met,

(2) monitor for unintended consequences including subsidence should the runnel soils and pannes/pools/waterlogged areas become exposed to oxygen as described in the Oxidation Subsidence Trajectory discussion in the NPC, or erosion within the runnel once flow is established,

(3) develop a plan to reverse or mitigate these impacts and

(4) maintain and monitor the runnel area over time in case of blockages (with impacts described in the Waterlogged Subsidence Trajectory discussion in the NPC.

In addition, as *Ruppia maritima* has been observed at the Essex site, and may occur elsewhere in pannes and pools, pre-monitoring of areas to be drained is recommended to understand potential impacts, if any, to submerged aquatic vegetation.

According to the NPC, sod from runnel creation will be placed at a nearby location to construct high marsh suitable for saltmarsh sparrow nesting. A total of 24 nesting islands are proposed to be created, with an average size of approximately 80-100 square feet for a maximum of 2,400 square feet. More detail and information should be provided on site selection of the placement of the marsh islands, how and if they will be secured, what monitoring will occur to detect salt marsh sparrow utilization of these areas, and a monitoring and maintenance plan for both meeting the goals of the project and also for unintended impacts (i.e. vegetation changes, subsidence from underlying vegetation decomposition if placed on the vegetated marsh platform, failure of the "marsh island" to establish, etc.).

As is recommended for any restoration project, standard operating procedures should be provided during permitting which outline practices to avoid the transfer of invasive species on equipment, machinery, and hay from outside sources.

Federal Consistency Review

The proposed project is subject to CZM federal consistency review and if so must be found to be consistent with CZM's enforceable program policies. For further information on this process, please contact Robert Boeri, Project Review Coordinator, at 617-626-1050, or visit the CZM web site at www.mass.gov/czm.

LE/kg

cc: Kathryn Glenn, CZM
Rachel Freed, DEP NERO
Chrissy Hopps, DEP Waterways

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection
Northeast Regional Office • 205B Lowell Street, Wilmington MA 01887 • 978-694-3200

Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Kathleen A. Theoharides
Secretary

Martin Suuberg
Commissioner

July 3, 2020

Kathleen A. Theoharides, Secretary
Executive Office of
Energy & Environmental Affairs
100 Cambridge Street
Boston MA, 02114

Attn: MEPA Unit

RE: Newbury
Old Town Hill Salt Marsh Restoration
EEA # 16033

Dear Secretary Theoharides:

The Massachusetts Department of Environmental Protection Northeast Regional Office (MassDEP-NERO) has reviewed the Environmental Notification Form (ENF) for the proposed Old Town Hill Salt Marsh Restoration in Newbury. MassDEP provides the following comments.

Wetlands

MassDEP-NERO has completed its review of the Notice of Project change for the Old Town Salt Marsh Restoration project in Newbury. The previously filed EENF proposed a pilot project using hand-mowed and braided salt marsh hay placed by hand in selected ditches within the marsh. This method was intended to encourage the revegetation of the ditches by slowing tidal flow and allowing sediment to settle out to create a substrate for new salt marsh growth. Although the technique is relatively new, it is an innovative approach that has been found to be successful at smaller scales in other locations, with no adverse impacts to marsh vegetation or function. The original pilot project proposed restoration of approximately 85 acres of salt marsh and was supported by MassDEP as it appears to meet the criteria of an Ecological Restoration Limited Project under the Wetlands Protection Act.

The NPC proposes to add an additional restoration method, known as "micro- runneling" to target areas where marsh subsidence has been identified. The method entails forming shallow (4-6 inch deep) linear swales approximately 1.5 - 2.5 feet wide to restore drainage in areas that contained natural channels in the past, but were eliminated as a result of agricultural activities or are unrecoverable due to subsidence. Runnels would be constructed using a low ground pressure track loader and would involve excavating marsh sod, which would be transplanted to the high marsh platform to create small nesting islands for saltmarsh sparrow (Ammodramus caudacutus). The area of the nesting islands would cumulatively total approximately 2400 s.f. of high marsh. According to the NPC, approximately 6.2 acres of additional area of salt marsh and LSCSF within the ACEC would be directly impacted, and the hydrology of approximately 50 additional acres of salt marsh would be affected. MassDEP is concerned about the lack of data to support the applicants' conclusions that micro-runneling will not result in an alteration and will improve salt marsh functions, as well as improve habitat for the salt marsh sparrow. In addition, the expansion of the area to be treated through the hand-mowing/hand-placement of hay seems premature without additional data to support its use.

MassDEP supports the research goals of this project and has met several times with the project proponents, as well as consulting with CZM. MassDEP concurs with CZM's comments and recommendations, particularly with regard to future monitoring, the metrics to be applied, and mechanisms, financial and otherwise, to ensure that any damaging effects can be fully and promptly mitigated. Based on the amount of direct impacts that would occur to the marsh through removal and filling activities associated with micro-runneling, MassDEP cannot support this waiver request. MassDEP encourages the applicant to develop the additional details and information as described in CZM's comment letter in order to continue to gather data about protecting the Great Marsh and gain insight about possible responses to sea level rise and climate change.

The MassDEP appreciates the opportunity to comment on this proposed project. Please contact Rachel.Freed@mass.gov at (978) 694-3258 for further information on wetland issues. If you have any general questions regarding these comments, please contact me at John.D.Viola@mass.gov or at (978) 694-3304.

Sincerely,

John D. Viola
Deputy Regional Director

cc: Brona Simon, Massachusetts Historical Commission
Eric Worrall, Rachel Freed, MassDEP-NERO

MASSWILDLIFE

DIVISION OF
FISHERIES & WILDLIFE

1 Rabbit Hill Road, Westborough, MA 01581
p: (508) 389-6300 | f: (508) 389-7890
MASS.GOV/MASSWILDLIFE

June 9, 2020

Kathleen A. Theoharides, Secretary
Executive Office of Environmental Affairs
Attention: MEPA Office
Purvi Patel, MEPA Analyst
100 Cambridge Street
Boston, Massachusetts 02114

Project Name:	*Old Town Hill Salt Marsh Restoration*
Proponent:	*The Trustees of Reservations*
Location:	*Newman Road and Hay Street, Newbury*
Document Reviewed:	*Notice of Project Change*
EEA No.:	*16033*
NHESP No.:	*08-25343*

Dear Secretary Theoharides:

The Natural Heritage & Endangered Species Program of the Massachusetts Division of Fisheries & Wildlife (the "Division") has received and reviewed the *Notice of Project Change* (NPC) and the supplemental information distributed by MEPA for the proposed OLD TOWN HILL SALT MARSH RESTORATION (the Project) and would like to offer the following comments regarding state-listed species and their habitats.

The Project site is mapped as *Priority* and *Estimated Habitat* for the Eastern Whip-poor-will (*Antrostomus vociferus*) according to the *Massachusetts Natural Heritage Atlas* (14th Edition). This species is state-listed as Special Concern. This species and its habitats are protected pursuant to the Massachusetts Endangered Species Act (MGL c.131A) and its implementing regulations (MESA; 321 CMR 10.00). Fact Sheets for this species can be found on our website, www.mass.gov/nhesp.

As proposed, the Project will expand on previously approved restoration activities. Specifically, the Project proposes management of fifty (50) additional acres of salt marsh within the William Forward Wildlife Management Area, including remnant agricultural ditch remediation, removing blockages to normal tidal flow in existing ditches, and restoration of select historic creek channels through runneling.

All projects proposed within Priority Habitat, which are not otherwise exempt from review pursuant to 321 CMR 10.14, will require review through a direct filing with the Division pursuant to the Massachusetts Endangered Species Act (M.G.L. c. 131A) and its implementing regulations (MESA; 321 CMR 10.00). The MESA is administered by the Division and prohibits the Take of state-listed species, which is defined as "in reference to animals…harm…kill…disrupt the nesting, breeding, feeding or migratory activity…and in reference to plants…collect, pick, kill, transplant, cut or process…Disruption of nesting, breeding, feeding, or migratory activity may result from, but is not limited to, the modification, degradation, or destruction of Habitat" of state-listed species (321 CMR 10.02).

Although the Division has not yet received a direct filing pursuant to the MESA for the proposed salt marsh restoration activities, the Division notes that habitat management activities may be exempt from MESA review pursuant to 321 CMR 10.14 (15), which state that "[t]he following Projects and Activities shall be exempt from the requirements of 321 CMR 10.18 through 10.23…"

> *[15] the active management of State-listed Species habitat, including but not limited to mowing, cutting, burning, or pruning of vegetation, or removing exotic or invasive species, for the purpose of maintaining or enhancing the habitat for the benefit of rare species, provided that the management is carried out in accordance with a habitat management plan approved in writing by the Division and;*

Based on the information contained in the NPC and the information contained in our database, the Division anticipates that the proposed Project will likely qualify for the habitat management exemption (321 CMR 10.14 (15)). We note that a habitat management plan must be submitted to the Division for formal review and approval prior to initiating work.

The Division looks forward to additional consultation with the Proponent regarding this Project. If you have any questions about this letter, please contact Rebekah Zimmerer, Endangered Species Review Biologist, at (508) 389-6354 or rebekah.zimmerer@mass.gov. We appreciate the opportunity to comment on this project.

Sincerely,

Everose Schlüter

Everose Schlüter, Ph.D.
Assistant Director

cc: Town of Newbury Select Board
Town of Newbury Planning Board
Town of Newbury Conservation Commission
Mary Rimmer, Rimmer Environmental Consulting
Pat Huckery, Northeast District Manager, MassWildlife

The COMMONWEALTH OF MASSACHUSETTS
BOARD OF UNDERWATER ARCHAEOLOGICAL RESOURCES
EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS
251 Causeway Street, Suite 800, Boston, MA 02114-2136
Tel. (617) 626-1014 Fax (617) 626-1240
www.mass.gov/orgs/board-of-underwater-archaeological-resources

July 3, 2020

Kathleen A. Theoharides, Secretary
Executive Office of Energy and Environmental Affairs
Attention: Tori Kim, MEPA Unit
100 Cambridge Street, Suite 900
Boston, MA 02114

RE: The Trustees of Reservations: Great Marsh Restoration – Phase II (EOEA #16210), Ipswich and Essex

Dear Secretary Theoharides,

The staff of the Massachusetts Board of Underwater Archaeological Resources has reviewed the above-referenced proposed project as detailed in the *Environmental Monitor* of 20 May 2020 and offers the following comments.

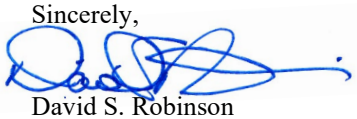
The Board has conducted a preliminary review of its files, the MHC's MACRIS archaeological site inventory geospatial database, historic maps, aerial imagery, and secondary literature sources to identify known and potential submerged cultural resources in the proposed project areas. No record of any underwater archaeological resources was found in either the Ipswich (William Forward WMA Salt Marsh) or the Essex (Crane Wildlife Refuge) project location. Based on the results of this review, and the limited nature of bottom lands (land under water) disturbance by the proposed project, the Board expects that this project is unlikely to impact submerged cultural resources.

However, the area may be archaeologically sensitive. Archaeological research indicates that certain types of environmental and topographical settings, particularly those that offered diverse resources on a consistent or seasonal basis, are strongly associated with the presence of precontact period archaeological deposits. Such settings include the interface of land and water as part of riparian systems that consist of rivers, creeks, estuaries, and bays. The MACRIS database records numerous pre-contact period archaeological deposits (e.g., shell middens or shell heaps and burials) in the vicinity of both the Essex and Ipswich project locations. One shell midden deposit, the "Kent Island Site" (19-ES-274), depicted in MACRIS, appears to extend from the southwestern corner of Kent Island into the William Forward WMA Salt Marsh Restoration project area.

Should heretofore unknown archaeological resources be encountered during the course of work, the Board expects that the project's sponsor will take steps to limit adverse effects (take care to not further disturb the archaeological resource and note its precise location) and notify the Board and the Massachusetts Historical Commission, as well as other appropriate agencies, immediately in accordance with the Board's *Policy Guidance for the Discovery of Unanticipated Archaeological Resources*.

The Board appreciates the opportunity to provide these comments as part of the MEPA review process. Should you have any questions regarding this letter, please do not hesitate to contact me at (617) 626-1014, or by email at david.s.robinson@mass.gov.

Sincerely,



David S. Robinson
Director

/dsr
Cc: Brona Simon, MHC
Robert Boeri and Kathryn Glenn, MCZM (via email attachment)
Bettina Washington, WTGH/A (via email attachment)
David Weeden, MWT (via email attachment)

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS
OFFICE OF COASTAL ZONE MANAGEMENT
251 Causeway Street, Suite 800, Boston, MA 02114-2136
(617) 626-1200 FAX: (617) 626-1240

MEMORANDUM

TO:	Kathleen A. Theoharides, Secretary, EEA
ATTN:	Tori Kim, MEPA Office
FROM:	Lisa Berry Engler, Director, CZM
DATE:	July 2, 2020
RE:	EEA-16210, Great Marsh Restoration Phase II; Essex and Ipswich

The Massachusetts Office of Coastal Zone Management (CZM) has completed its review of the above-referenced Expanded Environmental Notification Form (EENF), noticed in the *Environmental Monitor* dated May 20, 2020. The activities proposed to meet the stated goals of the project to restore salt marsh through re-establishment of natural flow, sedimentation and re-vegetation processes and the management of declining salt marsh sparrow habitat meet the categorical requirements for the preparation of an EIR. Because the proposed techniques have either not been tested in Massachusetts or have previously only been employed at small-scale research sites; data to be developed from this project may inform the design and implementation of similar projects throughout the coastal zone; and additional information is required to ensure that the project is consistent with CZM enforceable coastal policies, CZM does not support the request for a waiver from the requirement for the preparation of an Environmental Impact Report (EIR). We look forward to working with the project proponents as the project develops and offer the following comments.

Project Description

The EENF proposes restoration activities affecting up to 132 acres at the Crane Reservation in Ipswich and 111-acres within the Crane Wildlife Refuge and adjoining Stavros Reservation in Essex, which are both owned and managed by The Trustees. The EENF states that the goal for these areas is to reverse the trend of salt marsh subsidence, re-establish and maintain high marsh habitat, support native obligate marsh species such as the at-risk salt marsh sparrow and to improve coastal resiliency in the face of sea level rise. These sites were selected to expand a previously permitted pilot project begun within 85 acres of salt marsh at the Old Town Hill Reservation in Newbury, which is currently underway. The Newbury project site is currently under review to expand the original area by approximately 50 acres within the adjacent William T. Ford Wildlife Management Area. The EENF states that the project is proposed to restore salt marsh by encouraging re-vegetation of the historic ditch network within the project sites, thereby restoring more natural drainage characteristics to the affected area of marsh. The ditch remediation technique involves harvesting marsh hay by hand-mowing swaths of marsh parallel to the ditches to be treated. The mown hay is loosely braided and placed to depths of 8-9 inches within the pre-selected ditches, then secured with twine and wood stakes to the ditch bottom. The stated goal of this technique is to slow down tidal flow within the ditches to allow sediment to settle out of the water column and create a substrate for the establishment of native salt marsh vegetation, particularly *Spartina alterniflora.* This ditch remediation strategy is proposed for 218 out of a total of 332 ditches within the Ipswich site and for 225 out of a total of 335 ditches within the Essex site. In addition to ditch remediation, a supplemental restoration technique identified as "micro-runneling" is proposed at the expanded location to address targeted areas where more advanced subsidence has occurred. This process involves forming shallow 4-6-inch deep linear swales approximately 1.5-2.5 feet wide to restore drainage in areas that once contained natural

channels. These runnels are proposed to be constructed using a low ground pressure (2.3 psi) track loader. Material excavated will include primarily marsh sod, which is then proposed to be transplanted to the nearby high marsh platform to create small nesting islands as habitat for saltmarsh sparrow (*Ammodramus caudacutus*). In addition, identified primary channels in 21 locations in Ipswich and 9 locations in Essex contain small blockages approximately 4-feet in length which are caused by slumping peat. Part of the restoration effort will involve re-opening these blockages using hand tools to encourage flow without removing or relocating sediment. Although the increased tidal flow expected within these primary channels following treatment of the auxiliary ditches may eventually release the blockages naturally, addressing them during the treatment phase is proposed to minimize the potential that flow will be diverted around the blockages, causing unnecessary erosion of the marsh plain. At the Ipswich site, the proposed project will directly impact 42,075 square feet (SF) of salt marsh and land subject to coastal storm flowage (LSCSF) and 14,726 SF acres of riverfront area. At the Essex site, 49,911 SF of salt marsh and LSCSF and 24,546 SF of riverfront area are proposed for direct impact. The entire project is within the Great Marsh Area of Critical Environmental Concern (ACEC) and will affect up to 132 acres of salt marsh in Ipswich and 111 acres of salt marsh in Essex through changes in hydrology.

Project Comments

CZM is supportive of the project team's research goals and the important work of understanding how to protect the long-term health of the Great Marsh and facilitate its ability to respond to climate change impacts, including sea level rise. CZM has worked with the project partners toward these goals and continues to support opportunities to develop best management practices based on robust research.

If successful, this pilot project combined with the Old Town Hill restoration and the expansion of that project to include the William T. Ford Wildlife Area component (EEA#16033), may restore up to 378 acres of salt marsh in the Great Marsh ACEC. Success of this large-scale pilot restoration technique may have implications for other restoration efforts within the Great Marsh and areas where the conditions may be similar, particularly where remnants of agricultural manipulations are present and impacting hydrology. Supplemental information provided to MEPA on June 15 clarifies that the Ipswich and Essex projects are intended to be considered part of the initial pilot in Newbury to test the technique over a broader range of tidal conditions in different areas of the Great Marsh. In particular, the hydro-period for each project area differs due to slope, elevation, and proximity to the ocean. In addition, the expanded areas provide an opportunity to introduce a secondary restoration technique to the pilot program of overall adaptive ditch management strategy, specifically the use of micro-runnels and the formation of bird islands from the resulting marsh sod. The supplemental information also states that the project design for these areas has been developed with careful attention to site specific conditions, and that other combinations of restoration techniques may be more applicable in other locations. For this project to successfully serve as a pilot for other salt marsh restoration projects, an understanding of where and when this approach may be transferable to other locations and how it should be applied is required. To ensure the process can be replicated by others where appropriate, the proponent should develop a written protocol for the identification of appropriate project sites, survey requirements for feature mapping, ditch and channel selection for remediation, pre- and post-monitoring needs, specific physical restoration methods, and likely maintenance and adaptive management needs. Over time and with additional data, the protocol may need to be amended to reflect the findings from longer term monitoring and management.

The EENF states that the project goals are to reverse the trend of salt marsh subsidence, re-establish and maintain high marsh habitat, support native obligate marsh species such as the at-risk salt marsh sparrow and to improve coastal resiliency in the face of sea level rise. By conducting the proposed ditch remediation at a larger scale than previous efforts, and with the addition of the micro-runnel technique and bird islands, the goal is to demonstrate the efficacy of this approach as a restoration strategy at the landscape level. According to the filing, the goal is to help the marsh restore itself, eliminating much of the present waterlogging conditions, and permitting natural accretion which will eventually lead to restoration of high marsh areas. *Spartina alterniflora* established within the ditch bottom will serve as the initial indicator of successful restoration. While this indicates that the ditch remediation technique is successful, additional monitoring of the marsh plain between treated ditches is also proposed as long-term research into the ability of the treatment to successfully mitigate the on-going marsh subsidence, including observations of marsh plain elevation and vegetation changes toward a more sustainable high salt marsh plant community. The supplemental narrative states that successful implementation will result in successful tidal exchange within the runnel and the interruption in the development of a mega-pool trajectory. The project team anticipates that, as monitoring information from this project combined with findings from the expanded sites in Ipswich and Essex, are made available on the success of this restoration technique in the coming years, generalizations can be made as to its applicability under differing site conditions for additional projects. Based on these goals, an understanding of the results of this pilot project on a landscape level is critical to evaluate the effectiveness of this innovative restoration technique and to assess potential unintended impacts to the marsh and any adjustments to the approach which may be needed as part of adaptive management. Accordingly, additional proposals to use this restoration technique beyond the currently proposed, expanded pilot project areas should be contingent on demonstration of the success of this pilot in meeting the stated landscape level restoration goals, and the criteria for determining success at this level should be clearly specified.

According to filing documents, the restoration effort is weighted heavily on careful pre-treatment observations and assessment and post-construction monitoring to measure success, but it is not clear from the filing how observation and monitoring of these expanded areas will be achieved. A total of 218 of 332 ditches in Ipswich and 225 of 335 ditches in Essex are proposed for ditch remediation. Additionally, thirty locations within untreated primary channels with small blockages caused by slumping peat will be re-opened using hand tools to encourage flow without requiring the sediment to be removed or relocated, as was proposed in the initial treatment area. There are also two micro-runnels proposed at the Ipswich site totaling 278 linear feet (lf) and four in Essex, totaling 489 lf, which are proposed to be approximately 1.5 to 2.5 feet wide by approximately 4-6 inches deep. The excavated sod from each of these runnels is proposed to be transferred to nearby areas to create up to 24 (7 in Ipswich, 17 in Essex) high marsh microtopography "nesting islands" approximately 10 feet in diameter and 80 square feet in area, intended to support breeding habitat for saltmarsh sparrow. The EENF and the supplemental information provided during the MEPA review period stress the need for adaptive management to ensure that the modifications continue to function as designed, but the monitoring plan provided suggests that only a small percentage (8-10%) of the remediated ditch areas are proposed for pre-and post-monitoring. Permit documents should describe the monitoring methodology for the additional modifications, as well as the 90% of ditches not identified for pre- and post-monitoring, for maintenance needs and adaptive treatment. As the area proposed for treatment is expanded, it will be important to ensure that the capacity to appropriately monitor and address issues as they arise is maintained in order to ensure that the restoration goals are met for all treated areas.

The project proposal states that the restoration that will occur will be gradual and that further research is needed to determine whether the increase in vegetation and sediment deposition will continue on its own or require further intervention and whether it will result in stemming the rate of subsidence. However, tracking and monitoring for the project is only detailed for 2 years (to 2022). The EENF states that additional monitoring of the marsh plain between treated ditches will also be conducted for long-term research into the ability of the treatment to successfully mitigate the on-going marsh subsidence, including observations of marsh plain elevation and vegetation changes toward a more sustainable high salt marsh plant community. More detail on longer-term monitoring and Phase 4 of this approach, which includes adaptive management of the project sites, is needed. Ideally, a plan would be developed detailing the capacity to monitor the restoration actions over the long term, including how they will be monitored and by whom, what metrics will trigger adaptive management actions on site (and when and how those will be applied), and what measures will be taken to reverse actions taken by the project team if negative impacts are seen over time beyond the 2 year implementation period.

The EENF provides conclusive statements about current indicators of salt marsh health, including evidence of changes in vegetation, conversion of areas previously dominated by *Spartina patens* to *Spartina alterniflora* dominance, changes in salt marsh elevation due to subsidence, and expanded areas of marsh transitioning to unvegetated or sparsely vegetated mudflats, adversely affecting the ability of the marsh to provide resiliency from coastal storms and rising sea level. Only limited quantitative data on the baseline conditions of the marsh system project sites that leads to these conclusions is provided in the filing. More detail of the metrics that have been and will be collected for pre-monitoring of baseline conditions so that the impacts of this technique on the marsh system (both beneficial and negative) can be quantified is needed to better understand the rationale for site selection at these expanded locations.

The NPC and supplemental documents state that this approach is relatively new and innovative, but the methods employed have been tested in other locations at a smaller scale and were found to be successful, with no adverse impacts. While references have been provided for ditch remediation, there is minimal information about the success of marsh islands for the goal to improve salt marsh sparrow habitat or for runnels to improve marsh condition, and the EENF does not include discussion of the potential impacts of these techniques. The relevant data references and a discussion of how these support the use of these techniques should be provided. In addition, the establishment of a bond or escrow account to conduct any mitigation required due to the presence of adverse impacts should be provided.

As described in the EENF, runnels will be constructed using a low ground pressure (2.3 psi) track loader to form shallow 4-6 inch-deep swales in order to restore drainage. More detail should be provided on how the target depth will be ensured and measured, and how these areas will be tracked over time to:

(1) measure whether the goals of revegetation and reverse subsidence are met,

(2) monitor for unintended consequences including subsidence should the runnel soils and pannes/pools/waterlogged areas become exposed to oxygen as described in the Oxidation Subsidence Trajectory) discussion in the NPC, or erosion within the runnel once flow is established,

(3) develop a plan to reverse or mitigate these impacts, and

(4) maintain and monitor the runnel area over time in case of blockages (with impacts described in the Waterlogged Subsidence Trajectory discussion in the NPC.

In addition, as *Ruppia maritima* has been observed at the Essex site, and may occur elsewhere in pannes and pools, pre-monitoring of areas to be drained is recommended to understand potential impacts, if any, to submerged aquatic vegetation.

According to the EENF, sod from runnel creation will be placed at a nearby location to construct high marsh suitable for saltmarsh sparrow nesting. A total of 24 nesting islands are proposed to be created, with an average size of approximately 80-100 square feet for a maximum of 2,400 square feet. More detail and information should be provided on site selection of the placement of the marsh islands, how and if they will be secured, what monitoring will occur to detect salt marsh sparrow utilization of these areas, and a monitoring and maintenance plan for both meeting the goals of the project and also for unintended impacts (i.e. vegetation changes, subsidence from underlying vegetation decomposition if placed on the vegetated marsh platform, failure of the "marsh island" to establish, etc.).

As is recommended for any restoration project, standard operating procedures should be provided during permitting which outline practices to avoid the transfer of invasive species on equipment, machinery, and hay from outside sources.

Portions of the Crane Marsh site in Ipswich are directly adjacent to the ongoing Argilla Road elevation project, which will have direct impacts on this portion of the salt marsh. A better understanding of how that project may affect or intersect with this project is needed, particularly in terms of changes to delineated tide sheds, microtopography, and hydrology, and how that may change the design parameters of this project in the affected areas.

Federal Consistency Review

The proposed project is subject to CZM federal consistency review and if so must be found to be consistent with CZM's enforceable program policies. For further information on this process, please contact Robert Boeri, Project Review Coordinator, at 617-626-1050, or visit the CZM web site at www.mass.gov/czm.

LE/kg/ap

cc: Kathryn Glenn, CZM
Rachel Freed, DEP NERO
Chrissy Hopps, DEP Waterways

The Commonwealth of Massachusetts
Division of Marine Fisheries

251 Causeway Street, Suite 400, Boston, MA 02114
p: (617) 626-1520 | f: (617) 626-1509
www.mass.gov/marinefisheries

CHARLES D. BAKER, Governor | KARYN E. POLITO, Lt. Governor | KATHLEEN A. THEOHARIDES, Secretary | RONALD S. AMIDON, Commissioner | DANIEL J. MCKIERNAN, Director

June 19, 2020

Kathleen Theoharides, Secretary
Executive Office of Energy and Environmental Affairs
Attn: MEPA Office, Tori Kim
100 Cambridge Street, suite 900
Boston, Ma 02114

RE: EEA# 16210 Great Marsh Restoration – Phase II

Dear Secretary Theoharides:

The Division of Marine Fisheries (MA DMF) has reviewed the Expanded Environmental Notification Form (EENF) submitted by The Trustees of Reservations, for the Great Marsh Restoration – Phase II Ditch Remediation Projects in Ipswich and Essex. The project proposes to restore 243 acres of salt marsh within the Great Marsh Area of Critical Environmental Concern (ACEC), including 132 acres at the Crane Reservation in Ipswich and 111 acres within the Crane Wildlife Refuge and adjoining Stavros Reservation in Essex using a large-scale pilot restoration technique. The restoration efforts will address climate change related concerns such as sea level rise and storm surge.

The proposed project is located within the Great Marsh ACEC. Restoration work will occur along Castle Neck River and Castle Neck Creek in Ipswich and Hog Island Channel and Soginese Creek in Essex. Finfish species present in these creeks and rivers include rainbow smelt (*Osmerus mordax*), Atlantic tomcod (*Microgadus tomcod*), white perch (*Morone Americana*), alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), and American eel (*Anguilla rostrata*). Areas nearby have been mapped as shellfish habitat by MA DMF for soft shell clam (*Mya arenaria*), razor clam (*Ensis directus*) and blue mussel (*Mytilus edulis*) within shellfish growing areas N7.0 and N7.5 classified as conditionally approved.

The proposed project to restore the marsh includes encouraging the revegetation of portions of the historic ditch network within the project site, removing clogs within ditches and restoring some historic creek channels. The primary technique involves harvesting small amounts of salt marsh hay and placing it to depths of 8-9 inches within pre-selected ditches secured via twine and wood stakes. With the intent that the hay will slow down tidal flow within the ditches and allow sediment to settle out of the water column and create a substrate to establish additional salt marsh vegetation, specifically short-form cordgrass (*Spartina alterniflora*).

Post treatment monitoring will be conducted by the University of New Hampshire Jackson Marine Lab under the direction of David Burdick, Ph.D.. Additionally, MA DMF recommends that as clogs within the channels are removed, the new opened areas be monitored and maintained to ensure no adverse effects from this activity.

Thank you for considering our comments. If you have questions about this review, please email Kate Frew at Kate.Frew@mass.gov.

Sincerely,

Daniel J. McKiernan
Director

cc.
B. Boeri, CZM
E. Reiner, EPA
B. Newman, ACOE
K. Ford, T. Evans, M. Rousseau, MA DMF
M. Rimmer, Rimmer Environmental Consulting

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection
Northeast Regional Office • 205B Lowell Street, Wilmington MA 01887 • 978-694-3200

Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Kathleen A. Theoharides
Secretary

Martin Suuberg
Commissioner

July 3, 2020

Kathleen A. Theoharides, Secretary
Executive Office of
Energy & Environmental Affairs
100 Cambridge Street
Boston MA, 02114

Attn: MEPA Unit

RE: Essex, Ipswich
Great Marsh Restoration – Phase II
EEA # 16210

Dear Secretary Theoharides:

The Massachusetts Department of Environmental Protection Northeast Regional Office (MassDEP-NERO) has reviewed the Environmental Notification Form (ENF) for the proposed Great Marsh Restoration – Phase II in Ipswich and Essex. MassDEP provides the following comments.

Wetlands

MassDEP-NERO has completed its review of the Expanded Environmental Notification Form (EENF) for the Great Marsh Restoration Phase II project in Essex and Ipswich. The EENF proposes restoration activities in up to 132 acres at the Crane Reservation in Ipswich and 111 acres within the Crane Wildlife Refuge and adjacent Stavros Reservation in Essex. The sites were selected to expand a previously proposed pilot project in 85 acres of salt marsh at the Old Town Hill Reservation in Newbury, which is currently underway. The Old Town Hill Marsh project is undergoing MEPA review for an expansion of approximately 50 acres within the adjacent William T. Ford Wildlife Management Area (EEA 16033).

The proposed project is intended to restore salt marsh by using hand-mowed and braided salt marsh hay placed by hand in selected ditches within the marsh. This method is intended to encourage the revegetation of the ditches by slowing tidal flow and allowing sediment to settle out

to create a substrate for new salt marsh growth. Although the technique is relatively new, it is an innovative approach that has been found to be successful at smaller scales in other locations, with no adverse impacts to marsh vegetation or functions. The original pilot project (Newbury) proposed restoration of approximately 85 acres of salt marsh and was supported by MassDEP as it appears to meet the criteria of an Ecological Restoration Limited Project under the Wetlands Protection Act.

The EENF proposes to apply the original technique for ditch remediation, and to add an additional restoration method, known as "micro- runneling," to target areas where marsh subsidence has been identified. The method entails forming shallow (4-6 inch deep) linear swales approximately 1.5 - 2.5 feet wide to restore drainage in areas that contained natural channels in the past, but were eliminated as a result of agricultural activities or are unrecoverable due to subsidence. Runnels would be constructed using a low ground pressure track loader and would involve excavating marsh sod, which would be transplanted to the high marsh platform to create small nesting islands for salt marsh sparrow *(Ammodramus caudacutus)*. The areas to be filled for the nesting islands would cumulatively total approximately 2400 s.f. in the high marsh. According to the EENF, the project will directly impact approximately 42,075 s.f. of salt marsh and Land Subject to Coastal Storm Flowage and 14,726 s.f. of Riverfront Area in Ipswich. In Essex, approximately 49,911 s.f. of salt marsh and LSCSF and 24, 546 s.f. of Riverfront Area would be impacted. The entire project is located within the Great Marsh ACEC and anticipates restoring up to 132 acres of salt marsh in Ipswich and 111 acres of salt marsh in Essex through changes in hydrology. MassDEP is concerned about the lack of data to support the applicants' conclusions that micro-runneling will not result in an alteration and will improve salt marsh functions, as well as result in improved habitat for the salt marsh sparrow. In addition, the expansion of the areas to be treated through the hand-mowing/hand-placement of hay seems premature without additional data to support its use.

MassDEP supports the research goals of this project and has met several times with the project proponents, as well as consulting with CZM. MassDEP concurs with CZM's comments and recommendations, particularly with regard to future monitoring, the metrics to be applied, and mechanisms, financial and otherwise, to ensure that any damaging effects can be fully and promptly mitigated. In addition, as also noted in CZM's comments, portions of this project are adjacent to the Argilla Road elevation project. An evaluation of how the two projects interact is warranted. Based on the amount of direct impacts that would occur to the marsh through removal and filling activities associated with micro-runneling, MassDEP cannot support this waiver request. Based on the information currently provided in the EENF, it is MassDEP's opinion that the project could not be permitted under the Wetlands Protection Act and that a Variance would be required. MassDEP encourages the applicant to develop the additional details and information described in CZM's comment letter and looks forward to future consultation with the applicants.

The MassDEP appreciates the opportunity to comment on this proposed project. Please contact Rachel.Freed@mass.gov at (978) 694-3258 for further information on wetland issues. If you have any general questions regarding these comments, please contact me at John.D.Viola@mass.gov or at (978) 694-3304.

Sincerely,

This final document copy is being provided to you electronically by the Department of Environmental Protection. A signed copy of this document is on file at the DEP office listed on the letterhead.

John D. Viola
Deputy Regional Director

cc: Brona Simon, Massachusetts Historical Commission
Eric Worrall, Rachel Freed, MassDEP-NERO

MASSWILDLIFE

DIVISION OF
FISHERIES & WILDLIFE

1 Rabbit Hill Road, Westborough, MA 01581
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MASS.GOV/MASSWILDLIFE

May 28, 2020

Kathleen A. Theoharides, Secretary
Executive Office of Environmental Affairs
Attention: MEPA Office
Tori Kim, MEPA Analyst
100 Cambridge Street
Boston, Massachusetts 02114

Project Name:	*Great Marsh Restoration - Phase II*
Proponent:	*The Trustees of Reservations*
Location:	*Argilla Road, Ipswich; John Wise Lane, Essex*
Document Reviewed:	*Expanded Environmental Notification Form*
EEA No.:	*16210*
NHESP No.:	*20-39324*

Dear Secretary Theoharides:

The Natural Heritage & Endangered Species Program of the Massachusetts Division of Fisheries & Wildlife (the "Division") has received and reviewed the *Expanded Environmental Notification Form* (ENF) and the supplemental information distributed by MEPA for the proposed GREAT MARSH RESTORATION - PHASE II (the Project) and would like to offer the following comments regarding state-listed species and their habitats.

The Project site is mapped as *Priority Habitat* and *Estimated Habitat* for the Common Tern (*Sterna hirundo*) and Least Tern (*Sterna antillarum)* according to the *Massachusetts Natural Heritage Atlas* (14th Edition). Both species are state-listed as Special Concern. These species and their habitats are protected pursuant to the Massachusetts Endangered Species Act (MGL c.131A) and its implementing regulations (MESA; 321 CMR 10.00). Fact Sheets for these species can be found on our website, www.mass.gov/nhesp.

As proposed, the Project will occur in Essex and Ipswich. In Essex, management will occur on 111 acres at the Crane Wildlife Refuge and Stavros Reservation. In Ipswich, management will occur on 132 acres within the Crane Reservation. The management proposed at each location focuses on salt marsh restoration through remnant agricultural ditch remediation, removing blockages to normal tidal flow in existing ditches, and restoration of select historic creek channels through runneling.

All projects proposed within Priority Habitat, which are not otherwise exempt from review pursuant to 321 CMR 10.14, will require review through a direct filing with the Division pursuant to the Massachusetts Endangered Species Act (M.G.L. c. 131A) and its implementing regulations (MESA; 321 CMR 10.00). The MESA is administered by the Division and prohibits the Take of state-listed species, which is defined as "in reference to animals…harm…kill…disrupt the nesting, breeding, feeding or migratory activity…and in reference to plants…collect, pick, kill, transplant, cut or process…Disruption of nesting, breeding, feeding, or

migratory activity may result from, but is not limited to, the modification, degradation, or destruction of Habitat" of state-listed species (321 CMR 10.02).

Although the Division has not yet received a direct filing pursuant to the MESA for the proposed salt marsh restoration activities, the Division notes that habitat management activities may be exempt from MESA review pursuant to 321 CMR 10.14 (15), which state that "[t]he following Projects and Activities shall be exempt from the requirements of 321 CMR 10.18 through 10.23…"

> *[15] the active management of State-listed Species habitat, including but not limited to mowing, cutting, burning, or pruning of vegetation, or removing exotic or invasive species, for the purpose of maintaining or enhancing the habitat for the benefit of rare species, provided that the management is carried out in accordance with a habitat management plan approved in writing by the Division and;*

Based on the information contained in the EENF and the information contained within our database, the Division anticipates that the proposed Project will likely qualify for the habitat management exemption (321 CMR 10.14 (15)). We note that a habitat management plan must be submitted to the Division for formal review and approval prior to initiating work, and recommend that this plan include a timing restriction on work between May 15 and August 31 to avoid disruption to foraging and nesting activities of state-listed terns.

The Division looks forward to additional consultation with the Proponent regarding this Project. If you have any questions about this letter, please contact Rebekah Zimmerer, Endangered Species Review Biologist, at (508) 389-6354 or rebekah.zimmerer@mass.gov. We appreciate the opportunity to comment on this project.

Sincerely,

Everose Schlüter

Everose Schlüter, Ph.D.
Assistant Director

cc: Town of Ipswich Select Board
Town of Essex Select Board
Town of Ipswich Planning Board
Town of Essex Planning Board
Town of Ipswich Conservation Commission
Town of Essex Conservation Commission
Mary Rimmer, Rimmer Environmental Consulting