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BARNSTABLE, MASSACHUSETTS 02630



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June 17, 2020

Town of Wellfleet  
c/o Carol Ridley  
Executive Director  
Ridley & Associates  
115 Kendrick Road  
Harwich, MA 02645

**RE: Herring River Restoration Project – Phase 1**  
**Development of Regional Impact Decision**  
**CCC File No: 08009**

Dear Ms. Ridley:

Enclosed please find a copy of the Development of Regional Impact (DRI) Decision for the Herring River Restoration Project – Phase 1, Wellfleet. After the 30-day appeal period has elapsed and no appeal has been filed or that if such appeal has been filed, that it has been dismissed or denied, the Cape Cod Commission will record the original decision with the Barnstable County Registry of Deeds.

As requested, enclosed is a receipt for the Town Clerk to sign at the time that the decision is delivered by Ridley & Associates. Once, this is signed, please scan and email this to [ldillon@capecodcommission.org](mailto:ldillon@capecodcommission.org) at which time the 30-day appeal period will begin. Please mail the original copy via USPS.

Please let me know if you have any questions.

Sincerely,

Lisa Dillon  
Commission Clerk

Enclosure

CC: Certified Mail: Justin Post, Inspector of Buildings  
HAND DELIVERED BY RIDLEY & ASSOCIATES: Jennifer Congel, Town Clerk  
Regular Mail: Daniel Hoort, Town Administrator; Deborah Freeman, Chair,  
Conservation Commission

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## DEVELOPMENT OF REGIONAL IMPACT DECISION

PROJECT: Herring River Restoration Project – Phase 1, Wellfleet (CCC File No. 08009)  
APPLICANT: Town of Wellfleet c/o Daniel Hoort, Town Administrator  
Town Hall, 300 Main Street, Wellfleet, MA 02667  
DATE: June 11, 2020

### SUMMARY

The Cape Cod Commission (“Commission”), pursuant to a vote at its meeting on June 11, 2020, grants Development of Regional Impact (“DRI”) approval, with Conditions, for Phase 1 of the Herring River Restoration Project, which is proposed by the Town of Wellfleet, with support from partner agencies, to restore historic tidal flow and native coastal wetlands in portions of the Herring River floodplain and estuary system located in Wellfleet and Truro.

### FINDINGS

*The Cape Cod Commission hereby finds and determines as follows:*

#### BACKGROUND/EXISTING CONDITIONS

1. The Herring River system is an 1,100-acre tidally-restricted estuary located in the Towns of Wellfleet and Truro. Tidal restriction primarily caused by the Chequessett Neck Road (CNR) dike in Wellfleet has resulted in loss and degradation of water quality, and native tidal wetland habitat and its respective beneficial functions.
2. The Commission considered the historical context of the Herring River wetland ecosystem in its DRI review, which ecosystem has been altered over time. Historically, the Herring River ecosystem was the largest tidal estuary complex on the Outer Cape. The predominant view at the time the system was first substantially altered and diked in the early 1900’s was that diking and draining the marsh would control mosquitoes, and allow for development and economic growth.
3. Today, the predominant view and the view articulated in the Cape Cod Regional Policy Plan is that functioning natural wetlands is an important part of the solution to problems such as poor water quality, habitat loss, and impacts from sea level rise. Now, wetlands are protected by federal, state, regional, and local laws requiring careful review of proposed work that may alter wetlands. Those protections were not in place when the Herring River system was altered in 1909. As such, the proposed restoration is working towards fixing a past alteration and its corresponding, adverse impacts.
4. Prior to 1909, the Herring River estuary included approximately 1,100 acres of salt marsh, intertidal flats and open-water habitats. Due to more than a century of tidal restriction, approximately 10 acres out of the original 1,100 acres of salt marsh remain.

5. After the Herring River was significantly altered in 1909 with the construction of a dike and other resulting alterations, tidal exchange was restricted and resulted in loss and degradation of natural wetland resource areas and functions. Adverse ecological impacts from these and subsequent alterations (i.e., river channelization and straightening) include: tidal restriction (lack of tidal inflow and outflow) and reduced tide range; plant community changes (including loss of salt marsh vegetation and increase in non-native, invasive species); loss of estuarine habitat and degradation of water quality; alteration of natural sediment processes and increased salt marsh surface subsidence; nuisance mosquito production; and impediments to river herring and other anadromous fish migration.
6. In the 1970's, the dike was rebuilt because the tide gates had rusted frozen in an open position; however, it was not in compliance with tide heights to accommodate fish passage required by the Order of Conditions issued by the Wellfleet Conservation Commission in 1973. In the 1980s, there were die-offs of American eels (*Anguilla rostrata*) and river herring (*Alosa* spp.). Federal and state agencies attributed these die-offs to high acidity, aluminum toxicity, and summertime dissolved oxygen depletions resulting from the diking and marsh drainage.
7. National Park Service mosquito breeding research conducted from 1981 to 1984 found that mosquitoes (*Ochlerotatus cantator* and *O. canadensis*) were breeding abundantly in the Herring River. However, low tidal range, low salinity, and high acidity prevented estuarine fish, important mosquito predators, from accessing mosquito breeding areas.
8. In 1985, the Division of Marine Fisheries classified shellfish beds in the river mouth as "prohibited" due to fecal coliform contamination.
9. Since 2003, water quality problems caused the Massachusetts Department of Environmental Protection to designate Herring River as an Impaired Water under the Federal Clean Water Act for low pH, high metal concentrations, and pathogens, and the dike is a state designated point source for bacterial contamination responsible for the closure of hundreds of acres of once-harvestable downstream shellfish beds.
10. More recently, National Park Service researchers identified bacterial contamination as another result of restricted tidal flow and reduced salinity.
11. The Herring River system has been degraded because the man-made alterations to the system resulted in changes to hydrologic (i.e. lower water levels above the dike) and sedimentation (i.e. sediment blocked from reaching the floodplain preventing accretion and resulting in salt marsh surface subsidence) processes and allowed for the establishment of invasive Phragmites (common reed). These impacts adversely affect species composition and wetland functions. The Herring River constriction and associated water quality problems are barriers to migration and movement of resident aquatic species. Removal of constrictions in river systems can contribute to the restoration of aquatic habitats upstream and downstream by restoring the natural movement of water and sediment, and by reestablishing more natural temperatures and oxygen levels.
12. The Town has a documented history of fishery and other environmental concerns in the Herring River system over the last 50 years, which resulted in state intervention and mandated rebuilding and operational requirements for the CNR dike, some of which have not been implemented because of resident concerns in Wellfleet. It does not appear that current conditions meet the requirements of those prior permits and regulatory mandates, according to the DRI application; greater tidal flow and more open tide gates appear to be required under the existing permits, and the Project would achieve this permit consistency.

## PROJECT DESCRIPTION

13. The Town of Wellfleet submitted a Development of Regional Impact (DRI) application to the Cape Cod Commission (“Commission,” “CCC”) for Phase 1 of the Herring River Restoration Project (“HRRP”), dated December 2019. The DRI application included Attachments 8A through 8H, with Attachment 8H being preliminary design plans for the various water control elements and property flood mitigation work proposed. The Applicant submitted supplemental application materials dated April 17, 2020 responding to comments and requests for further information made in the CCC staff report and public hearing comments.
  - a. In its supplemental DRI application filing dated April 17, 2020, the Applicant provided a Project framework and estimated schedule of Phase 1 key activities/ responsibilities for the period 2020-2027, which includes, among other things, line items for permitting and construction of all the primary water control structures proposed. The timeline described is intended to be a high-level representation of three stages of Phase 1 restoration activity: (a) permitting and design, (b) bidding and construction, and (c) the first several years of tidal restoration.
14. As used in this Decision, the “Project” refers to this Phase 1, and *vice versa*.
15. Phase 1 consists of the following ‘primary elements,’ i.e. principal water control components and other principal actions to facilitate tidal flow: (1) replacement of a portion of the existing earthen dike and tidal control structure at Chequessett Neck Road with a new bridge and tide gate system; (2) construction or alteration of other tidal control structures at the entrances to the Mill Creek and Upper Pole Dike Creek sub-basins; (3) removal/ abandonment of a portion of High Toss Road where it crosses the marsh between the Lower Herring River and Lower Pole Dike Creek sub-basins.
16. Two structures described in the DRI application, the Mill Creek Water Control Structure and the tide barrier to protect Way 672, are to be built on federal land by the federal government with ownership retained by the federal government and, therefore, are not subject to Cape Cod Commission DRI jurisdiction and review. The NPS/ CCNS will seek all applicable permits for those activities. (The activities are described for purposes of comprehensiveness and illustration). These are subject to the MOU between NPS/ CCNS and the Town, in which NPS/ CCNS commits to carrying through this work and associated funding, management actions and operations for construction and when built.
17. Phase 1 also includes ‘secondary actions,’ i.e. related vegetation and marsh management to enhance and support the principal tidal restoration actions, such as channel clearing to improve stream connectivity, sediment supplementation to elevate marsh surface, Phragmites removal or control and removal of certain dead or dying plant matter. No herbicide use is proposed for the Project.
18. Phase 1 proposes measures to prevent or mitigate potential flood impacts to structures on public and private properties. Mitigation work includes raising and renovating portions of the Chequesset Yacht and Country Club’s (“CYCC”) golf course; elevating low lying roadway segments (Pole Dike, Bound Brook Island, High Toss and Old County Roads); mitigation measures on a Bound Brook Road private residence; private residential wells on Mill Creek Lane; tide barrier for Way #672 and neighboring private residential development. The DRI application states that CYCC and Project representatives have jointly acknowledged that the regulatory approvals and funding to implement the golf course work are dependent on actions beyond the control of either party. CYCC and the Project representatives are working on an agreement to formalize their mutual understandings, obligations, rights and commitments to one another relative to the Project.
19. In Phase 1, all principal water control components and the vast majority of potential effects of restoration will take place within the Town of Wellfleet, and thus the Town of Wellfleet is the sole applicant hereunder.

20. Within the Phase I area, 540 acres or 95% is owned by the United States and managed by National Park Service/ Cape Cod National Seashore (CCNS).
21. All Phase 1 area is currently under regulatory wetlands jurisdiction.
22. The Town included a letter of consent and support from the Cape Cod National Seashore ("CCNS") in the DRI application. The U.S. National Park Service ("NPS") administers the CCNS. The Towns of Wellfleet and NPS are parties to a Memorandum of Understanding ("MOU") established to guide implementation of the Herring River Restoration Project. The CCNS has pledged continued support, coordination and cooperation in the implementation of the proposed restoration activities.
23. For purposes of the DRI review and this decision, the project site consists of the parcels within the limits of disturbance for construction of the above-referenced water control components, including any ancillary/staging areas necessary during construction (collectively, "Project Site").
24. The Project Site is located entirely within Wellfleet on land owned by the Town of Wellfleet or the National Park Service. Much of the proposed restoration area and some of the Project water control components are in or adjacent to the CCNS. Out of the approximately 570 acres covered under Phase 1, approximately 540 acres are within the CCNS; 9 acres are owned by the Wellfleet Conservation Trust; 10 acres are owned by CYCC; and approximately 10 acres are located on portions of 11 private residential parcels.
25. The Project Site (areas in the vicinity of the primary, water control elements) is distinguished from areas where mitigation and secondary management activities are proposed as part of the Project, which include measures such as: elevating low-lying road sections (Pole Dike, Bound Brook Island, High Toss and Old County Roads), installing upgraded culverts, and improving stormwater management on these road segments; installing a flood control structure on Cape Cod National Seashore property; marsh/channel work; and completing flood protection measures at the CYCC and other specified private properties to protect public and private structures from potential damage resulting from increased Phase 1 tidal flow.
26. Subject to certain operational controls and project management, Phase 1 is anticipated to re-establish tidal exchange and restore approximately 570 acres of native coastal wetlands in the approximately 1,100-acre Herring River estuary system. Phase 1 includes all water control infrastructure needed for full tidal restoration of the Herring River system, but only seeks to allow tidal flow to a degree necessary to restore 570 acres (out of a possible 890 total acres capable of full restoration of the Herring River system).
27. The Town agrees that maximum mean high tide measurements shall serve as the primary limiting factor for the extent of tidal exchange in Phase 1. The Town proposes to restore (and gauge restoration of) the approximately 570 acres by opening tide gates on the new Chequessett Neck Road bridge to a configuration (i.e. number of gates opened and size of openings) that achieves a maximum, 'not to exceed,' mean high tide in Lower Herring River of 3.6 feet NAVD88. This translates to restoring approximately 21 acres in the Mill Creek subbasin with a water level not to exceed 2.5 feet NAVD88 during Mean High Water Spring (MHWS).
28. The Town would undergo further review by the Commission to authorize further Project phases and tidal exchange beyond that authorized in Phase 1. Similarly, any proposed future increases in water levels and project phases beyond those approved in permitting for Phase 1 would also require further permit review, permit amendments or new permits from other applicable agencies and authorities as well as further agreements with potentially affected property owners for any necessary measures to protect structures from the effects of tidal restoration.

## **PROPOSED PROJECT**

29. In the DRI application, the Town has documented coastal wetlands and water quality degradation associated with tidal restriction, including marsh subsidence, low oxygen, high metals, and acid soils, all signs of a coastal river and tidal wetland system that is degraded and in need of restoration.
30. The Project will reconnect Herring River with Cape Cod Bay, Wellfleet Bay and the Gulf of Maine, thereby restoring the natural coastal food web on which numerous fish, shellfish, birds and other wildlife depend.
31. The Project is within the Wellfleet Harbor Area of Critical Environmental Concern (ACEC) and Outer Cape Cod Important Bird Area (IBA).
32. The Project represents a unique opportunity to restore significant ecological resources and ecosystem services (including social and economic benefits to the community) provided by a healthy estuary, given the level of public ownership and control in the project area; the relatively minimal existing level of development located in the Herring River system; the reversibility of adverse conditions and actions in the system; and the relatively short history of human activity which has led to degraded conditions.
33. The Project will also allow the Herring River system to achieve compliance with applicable total maximum daily loads for certain pollutants established under the Federal Clean Water Act. This is especially important given the amount of land in the Herring River system under federal administration and ownership.
34. The proposed replacement of the Chequessett Neck Road Bridge, which is the main element of the Project, is in large part a redevelopment project which will bring existing conditions into greater compliance with Clean Water Act standards and the subject existing Wetlands Order of Conditions and provides the opportunity to restore the Herring River ecosystem through increased tidal flow. Herring River alterations in the 1900's allowed for the construction and presence of the CYCC and several homes in the floodplain system. While the ecological goal is to restore the full natural tidal range in as much of the Herring River flood plain as practicable, tidal flooding in certain areas will be controlled to protect certain existing structures.
35. Phasing of the full, overall Herring River Restoration Project is contemplated in the Secretary's Final Environmental Impact Report (FEIR) Certificate issued under the Massachusetts Environmental Policy Act (MEPA), and the impacts of Phase 1 are within the scope of impacts and the preferred alternative identified in the FEIR. Phase 1 of the Herring River Restoration Project, as described herein, is a less expansive project than the full Herring River Restoration Project described in the FEIR Certificate.
36. There have been five DRI hearing period extensions since the MEPA FEIR Certificate issued, which have afforded the Town time to prepare a DRI application responsive to community comments and concerns, conceive of Phase 1 as a permit phase in the overall restoration plan, establish a scope for DRI review, and undergo DRI review. The Town suggests that since the Commission began its review of the Project during the MEPA process, the Project has evolved in ways that provide greater protection of floodplain properties and structures. The scope of the Project has been further defined, detailed plans have been developed for measures to protect public and private structures, and further discussions and agreements with property owners have taken place, including during the extension periods with the Commission.
37. The Applicant had developed a two-dimensional hydrodynamic model for the HRRP that established the feasibility of tidal restoration and analyzed the effects of restoring tidal flow to different parts of the estuary. This included three different scenarios for sea level rise over the next 50 years and analysis of numerous combined storm events. The model was also used to develop and analyze alternatives for the

FEIR based on balancing degrees of tidal restoration with necessary measures to prevent inundation of structures.

38. The overall Phase 1 restoration extent will be achieved by opening tide gates of the new Chequessett Neck Road Bridge. The tide gates will be opened incrementally over a number of years while monitoring of ecosystem responses is undertaken, and may be closed at any time if circumstances warrant. No tidal restoration is proposed for the Upper Pole Dike Creek sub-basin under Phase 1 as currently envisioned.
39. The Mill Creek, Chequessett Neck Road and Pole Dike Road water control structures will be constructed and operable when Phase 1 tidal restoration commences, i.e. when the tide gate openings at the proposed Chequessett Neck Road water control structure cause the volume of tidal water flowing in and out of Herring River to exceed the volume of tidal water flowing in and out of Herring River under existing conditions.
40. All mitigation work necessary to protect structures on specific public or private property during Phase 1 tidal restoration will be in place prior to any potential impact to such structures from tidal restoration on the subject property, i.e. when monitoring and modeling indicate the potential for tidal water to reach the elevation of the structure for which mitigation is proposed, as delineated on plans provided in Appendix 8.H; and all Phase 1 mitigation work is designed to protect structures under full tidal restoration conditions (although the Project is currently seeking permission for only Phase 1 tidal restoration).
41. The primary flood protection objective of the Project is to prevent adverse flooding impacts to the built environment from increased water levels throughout the Project area, including during storm events. All flood protection mitigation measures have been designed to prevent impacts up to the modeled storm-of-record tidal surge with appropriate freeboard. However, neither the current CNR dike nor the replacement structure is or is intended to function as a FEMA-designated flood control structure.
42. The Project's water control structures will be operated in a manner that avoids impacts to low-lying structures in the floodplain before, during or after the installation of proposed mitigation. The Town agrees that maximum water levels in all areas of the estuary affected by Phase 1 tidal restoration will be kept below elevations that could impact any structures that are not protected by Phase 1 flood protection or mitigation measures. Water levels will be continuously monitored throughout the system using an established Continuous Real-Time Water Level and Water Quality Network.
43. Project implementation will be governed by a locally-appointed decision-making council of municipal and CCNS officials, and informed by comprehensive modeling, monitoring and analysis so that unexpected and/or undesirable responses can be detected early on and addressed with appropriate response actions in project implementation.
44. The formal restoration planning process began in 2005, when the NPS/ CCNS and Town of Wellfleet entered into a Memorandum of Agreement (MOU) to study restoration feasibility. Recently, the Town and NPS/ CCNS entered into a new MOU (MOU IV) to implement the restoration plan. The Town of Truro, originally a party to prior MOUs, is not a party to the superseding MOU IV and has adopted a new role as an interested municipal stakeholder fully supporting the ecological restoration objectives of the Project.
45. MOU IV between Wellfleet and NPS/ CCNS establishes a Herring River Executive Council (HREC) consisting of three members from Wellfleet and two from CCNS to be responsible for approving all major Project implementation decisions and activities which include establishing and providing policy direction; reviewing and approving the Project's Adaptive Management Plan; modifying or altering Project infrastructure water control structure openings (after receiving technical input from the members of the

Herring River Technical Team (HRTT), an informal sounding board comprised of intergovernmental technical staff. HREC meetings are also open to the public and the HREC will consider public comment in its decision-making. The HREC will, among other things, adopt a tide gate management policy to achieve Phase 1 restoration, after receiving advisory technical input from the members of the HRTT.

46. In addition to the HREC and HRTT, there is a Herring River Stakeholder Group (HRSG) and a regulatory oversight group (ROG) (on which the Cape Cod Commission has continuing representation through staff), all as required and referenced under the MEPA FEIR certificate and established in the MEPA special review process.
47. Restoration will be guided by an adaptive management plan and Commission staff will participate in that plan's review throughout the life of the restoration as a representative on the ROG. The ROG allows continued participation by representatives of regulatory authorities having jurisdiction over the project post-permitting after related construction is commenced and the Project continues through adaptive management planning.

### **ADAPTIVE MANAGEMENT**

48. The Project is intended to re-establish natural tidal flow to the estuary incrementally using an adaptive management approach that will balance ecological goals with water level control measures to allow the highest tide range practicable while protecting potentially vulnerable structures on public and private properties, including roads and homes. The Project's Herring River Adaptive Management Plan (HRAMP), will assist in iterative, operations and management decision-making under evolving social, economic and environmental circumstances and conditions. According to the DRI application, planning for the Herring River restoration has included detailed scientific studies, extensive stakeholder engagement and public discussions with local leadership. Decision-making during Phase I restoration will continue to be science-based through on-going monitoring of water and sediment quality and other factors that informs an adaptive management planning process.
49. Adaptive Management is a type of structured decision-making process that promotes flexibility by adjusting decisions as outcomes from management actions and other events become better understood. An AMP is based on predictive models which are iteratively updated through data collection and monitoring. Similarly, in its jurisdiction and review of them, the Commission requires that municipal watershed and wastewater management programs, which are programmatically similar to the Project, employ AMPs.
50. The DRI application, Section 5, provides in relevant part: *The proposed adaptive management plan is a rigorous science-based process of predicting system responses to restoration actions; monitoring system conditions before, during and after management actions are implemented; comparing the predicted and observed system responses to update the understanding of the system response to management actions; and using the results to inform and refine management actions. Information obtained from monitoring improves the ability to predict future outcomes and make better 'adaptive' decisions regarding the selection of appropriate management actions throughout the course of implementation.*
51. As defined in the DRI application, 'ecological restoration' is the return of an ecosystem to a close approximation of its condition prior to disturbance in 1909. The current state of the river is the combined effect of many alterations over many years; similarly, restoration of the river will also require multiple actions over many years to return it to a more fully functioning natural system. These actions will be guided by the Project's permit conditions and HRAMP. As noted in the application, the restoration project is the result of decades of scientific studies and planning.



52. Following adaptive management guidelines, the Project will restore tidal flow incrementally while water quality, vegetation, tide levels, salinity, sediment movement and many other environmental factors are monitored and compared with pre-restoration conditions and expected changes. The rate of tidal restoration can be slowed, reversed, or increased based on the system response as indicated by monitoring data.
53. Adaptive Management is a necessary, and likely the only feasible, process to administer the Project, that would both allow the Project purpose to be achieved while accounting and adjusting for and addressing broader project impacts and concerns over the short- and long-term. For the restoration, post-restoration decisions will depend on future monitoring to confirm predictions made during project planning, for which an adaptive management plan to guide these decisions is necessary essential.
54. The DRI application includes the description of the proposed Project HRAMP that will be used as a guide to make future decisions about restoration of tidal flow in relation to vegetation, tide levels, water quality, salinity, sediment movement and other environmental and socioeconomic factors. It is important these factors be carefully and adequately monitored to compare with pre-restoration conditions and expected changes so that informed decisions on future actions can be made.
55. Adaptive management actions will be undertaken and approved in accordance with the HRAMP to be approved and administered by the Project's governing entity, the HREC. In approving the HRAMP, and in making management decisions under the HRAMP, the HREC will receive advisory input from the Regulatory Oversight Group, HRTT and stakeholders. Project partners or other entities designated by the HREC will implement the HRAMP, ensuring that project-related decisions will be the product of thorough scientific research and analysis, transparent decision-making, and opportunities for public input.
56. The HRAMP is based on five fundamental restoration objectives: 1) maximizing hydrography functions, 2) maximizing ecological functions, 3) minimizing adverse impacts, 4) maximizing ecosystem services, and 5) minimizing costs. The HRAMP provides a systematic decision-analysis framework to evaluate project outcomes relative to each objective. Each fundamental objective is comprised of sub-objectives matched with quantifiable performance measures, means for predicting expected future outcomes, and monitoring methods aimed at evaluating predictions and tracking progress toward each objective.
57. Table 8B-1 found in Section 8.B of the DRI application provides a summary of the performance measures, prediction tools and monitoring methods that will be employed for each restoration objective and sub-objective under the proposed HRAMP, which is still in draft or preliminary form, subject to an ongoing process to improve predictions for a full suite of objectives. Through representation in the Regulatory Oversight Group, staff will participate for the Commission in final HRAMP preparation and review, and its implementation.
58. The HRAMP objectives include and align with those applicable to the Project from the RPP. The project team has developed decision support software to employ the HRAMP. The HRAMP, informed by data collection, monitoring and feedback analysis, will be designed to predict the consequences of project actions, in terms of both assessing progress in achieving the Project's restoration purpose but also in assessing potential associated impacts. HRAMP decisions will ultimately be based on weighing trade-offs and risks in adopting or avoiding certain actions, informed by technical and data analysis.
59. A robust monitoring program is crucial to the success of and will inform future decisions on this Project (and may also have the benefit of informing other wetland restoration projects throughout the region). Cape Cod National Seashore has been the primary coordinator for monitoring and data analysis for the Herring River Restoration Project. The DRI Application provides that the National Park Service intends its

scientists to continue this role as the project is implemented in collaboration with Friends of Herring River, other project team agencies, US Geological Survey, Center for Coastal Studies, and other partners.

60. One of the primary decisions the HRAMP is designed to support is the incremental opening of the CNR bridge tide gates to achieve the restoration goals of Phase 1. The new Chequessett Neck Road bridge structure with removable and adjustable tide gates will allow for the controlled and gradual transition from the constricted condition to a more natural tidal exchange. Functional benefits provided by the tide gates include a safe and secure mechanism for adjusting and controlling flow into and out of the Mill Creek sub-basin; and mechanisms that are easily operated, allowing persons of varying technical background and physical ability to operate the gates. The duration of the first stage of Phase 1 restoration depends on multiple variables related to system response to restoration and adaptive management decisions made during implementation.
  - a. If, for instance, during the early stages of Phase 1 tidal restoration, refined modeling indicates that the permitted maximum Phase 1 water levels for the main Herring River basin could cause water levels anywhere in the Project area to exceed elevations of the lowest low-lying structures, proactive adaptive management actions will be implemented to prevent impacts to include reducing the permitted maximum Phase 1 water levels allowed in the main Herring River basin by closing tide gates, drainage improvements within sub-basins, and/or additional on-site mitigation for low-lying structures (such as raising structures or constructing berms).
61. In terms of water quality and the HRAMP, the Applicant is working with a group of water quality experts (and other expert groups for other topics) to elicit predictions of how water quality will respond to various strategies for opening tide gates at key time steps during the restoration process. Once tidal restoration has begun, data collected at several locations throughout the system will be compared with these expert predictions. Baseline measurements of water quality parameters will be compared with data collected as the restoration project is implemented. If actual observed data is within the range of variability established by the expert predictions, this would indicate that the Project effects are as expected, with future decisions made accordingly. Data occurring outside the established range would signal unexpected results and prompt possible alternative management responses. The expected water quality improvements that are the basis for attaining multiple restoration objectives will be evaluated in parallel with other fundamental restoration objectives and subobjectives through the HRAMP's structured decision-analysis framework. In some instances, the speed at which a particular sub-objective is attained will be influenced by the need to balance progress on other sub-objectives; therefore trade-offs are expected to be necessary.
62. Adaptive management during Phase 1 encompasses marsh management actions, which include channel clearing, vegetation management and measures to elevate the subsided marsh plain. Marsh management actions will be undertaken as needed once tidal restoration begins based on monitoring of the system's response. Marsh management actions will be undertaken in stages as needed based on natural processes. Marsh management begins with passive management (stage 1) and tide gate management (stage 2). Active (e.g., mechanical) marsh management actions are considered the third stage of marsh management actions, to be undertaken only if stages 1 and 2 have not resulted in sufficient channel clearing and/or marsh plain accretion needed for mitigation and/or to enhance restoration objectives. Vegetation management decisions for Phase 1 will also be covered and determined under the HRAMP.
63. Related to adaptive management, the DRI Application and supplement include sections on Project budgeting and funding information that identifies several sources of funding the project team has secured and is pursuing (funding will be through grants and fundraising). Many management activities are pending or contingent on availability of future funding.

64. The Phase 1 Project budget includes funding for: (a) the construction of all water control infrastructure; (b) the construction of all necessary mitigation work to protect low-lying public and private structures during Phase 1; and (c) the first five years of adaptive management. Funding for mitigation work includes the elevation and installation of a water control structure) at Pole Dike Road, and the elevation of segments of Old County and Bound Brook Island Roads; for mitigation work at Chequessett Yacht and Country Club; and for other mitigation to protect structures on other low-lying properties.
65. Approximately \$11 million in construction funding has been allocated in the state's Capital Plan for the Project. \$7.5 million dollars is budgeted for 5 years of adaptive management and monitoring. This includes \$4.5 million for pre-restoration baseline monitoring and for marsh and vegetation management activities necessary to prepare marsh areas for restoration and to avoid the presence of excessive biomass from salt-killed vegetation and \$3 million for post-restoration monitoring.
66. Project design plans for the water control structures, low-lying roadway work and certain mitigation actions were provided in Attachment 8H of the DRI application. Construction specifications and best management practices were included in the notes and detail sections of those plans. The Project team plans to develop and refine those and other required Project plans with greater construction-level details as the Project proceeds through and completes permitting. The Project teams will also codify and compile best management practices (BMPs) for construction and include these in bid specifications and final Project plans for all water control and mitigation elements, including a set of consistent best practices for environmental mitigation actions during construction; specifications for site restoration and replanting; native seed mix specifications and application rates; channel and embankment stabilization measures; planting notes and details; and details regarding stormwater, sediment, soils, vegetation, and debris management. The best practices will minimize disturbance of natural areas during construction, and promote short-term stabilization and long-term restoration of native riparian vegetation.
- a. Project contractor(s) also will be required to abide by best construction management practices necessary for compliance with permit conditions.
  - b. There will be beneficial reuse of sediment in the project area, as feasible and appropriate.
  - c. All plan sets include notes that seed mixes shall not include invasive non-native species.
  - d. The Project is not seeking permission to use and does not intend to use herbicides in Phase 1 permit applications.
  - e. The Project will specify the use of straw bales in construction plans and specifications. (Note that the Wellfleet Conservation Commission requires the use of straw bales over hay bales for erosion control purposes so as to avoid the spread of non-native seeds in wetland resource areas).
  - f. Long-term stockpiling of excavated soils will be avoided. If long-term stockpiling of soils is required, soil stockpiling best practices will be followed to prevent erosion and growth of invasive plant species. Topsoil will be separated and retained for restoration purposes. Soil management and erosion control also will be governed by any Orders of Condition to be issued by the Wellfleet or Truro Conservation Commissions, and other conditions of permit granting authorities. The construction notes pages in the plan sets provided with the DRI application include notes about temporary stabilization, suitable planting date ranges and other relevant construction best practice information.
  - g. A Sediment Management Plan for dredging and dredge material management will be incorporated in permit applications for Section 401 Water Quality Certification from Massachusetts Department of Environmental Protection and Section 404 Individual Permit from the U.S. Army Corps of Engineers. The Sediment Management Plan will encompass protocols for testing and managing sediments, including the potential for beneficial reuse. The plan will need to demonstrate avoidance of adverse impacts to the physical, chemical, or biological integrity of waters of the Commonwealth. Soil and erosion controls and erosion protections also will be spelled out in the Notice of Intent to

be covered under the National Pollution Discharge Elimination Service General Permit, as well as the Notice of Intent submitted to the Wellfleet and Truro Conservation Commissions.

- h. Operation and maintenance plans are currently being developed and will be incorporated into state and federal permit applications as needed. The application for Section 401 Water Quality Certification from Massachusetts Department of Environmental Protection requires operation and maintenance plans for all stream crossings, which encompasses: Chequessett Neck Road bridge, Pole Dike Road water control structure, Mill Creek water control structure, and other upgraded culverts installations associated with low road mitigation work, including how the tide control structures will be operated and maintained, how often maintenance activities are anticipated, and how structures will be accessed.
- i. A Water Control Plan(s) will be developed and implemented during construction or installation of water control infrastructure. The contractor(s) for water control structures will be required to develop a Water Control Plan, to encompass any associated dewatering activities, for any in-water work to ensure compliance with Time of Year restrictions for fish and other aquatic species and to avoid or minimize erosion and suspension of sediments.

#### **DRI JURISDICTION/ PROCEDURAL BACKGROUND**

- 67. The Herring River Restoration Project, and proposed Phase 1 thereof, qualifies as a mandatory Development of Regional Impact (“DRI”) pursuant to Sections 2 & 3 of the Commission’s “Enabling Regulations Governing Developments of Regional Impact,” revised April 2018 (“Enabling Regulations”).
- 68. The Project was required to prepare an EIR under Massachusetts Environmental Policy Act. The Secretary of the Commonwealth’s Executive Office of Energy and Environmental Affairs issued a Certificate for the full potential restoration area (approximately 890 acres) of the Herring River Restoration Project (EEA # 14272) in July 2016 determining that its Final Environmental Impact Report properly and adequately complies with MEPA. The MEPA process allowed for a ‘special review process,’ requiring in part establishment of a community action committee, and the MEPA Certificate on the FEIR recognizes the various technical and regulatory review and governance structures (such as the HREC) that will administer the Project.
- 69. A Commission staff hearing officer opened the DRI public hearing period on the Herring River Restoration Project procedurally in September 2016, and the period has been extended five times by the Commission and the Town, currently extended through July 2020.
- 70. A DRI scoping decision was issued by the Commission’s Committee on Planning and Regulation in March 2019 to determine the relevant RPP issues for subsequent DRI review.
- 71. The Town of Wellfleet is the sole Applicant for purposes of DRI review. The Town submitted a DRI application for the Project to the Commission on December 12, 2019. The Applicant submitted supplemental DRI application materials to the Commission dated April 17, 2020 responding to comments and requests for further information made in the CCC staff report and in public hearing comments.
- 72. A DRI Subcommittee (“Subcommittee”) held a substantive public hearing session on the Project on March 9, 2020 in Wellfleet. Commission staff prepared a staff report on the Project, dated March 2, 2020, in advance of the hearing. The Subcommittee held a continued public hearing session on April 30, 2020, and further continued the hearing to the full Commission meeting on June 11, 2020.
- 73. The Subcommittee held a meeting on June 3, 2020 to discuss a recommendation on the DRI to the full Commission. Staff had prepared a draft DRI decision for the Subcommittee’s consideration at the meeting, dated 5/25/2020. The Subcommittee voted to recommend a draft written DRI decision to the full Commission.

74. The Commission received a significant amount of oral and written testimony throughout the DRI review and hearing process. The majority of comments expressed support for the Project and recognized its various community, environmental and economic benefits. Concerns or comments in opposition tended to be local in nature and from individual property owners in the Herring River system, focusing on the changes to the use and enjoyment of their individual properties and on the purported uncertainties inherent in the Project.
75. The Cape Cod Commission held a continued hearing on the Project at its meeting on June 11, 2020. Among other things, the Commission heard additional testimony and considered the draft written DRI decision recommended of the Subcommittee, dated 6/3/2020. At this meeting, the Commission voted to close the public hearing, adopt the draft written DRI decision dated 6/3/2020, and approve the Project, subject to the Conditions in said decision.

#### **DRI STANDARDS OF APPROVAL**

76. Section 7(c)(viii) of the Commission's *Enabling Regulations* contains the standards to be met for DRI approval, which include, as applicable, consistency with the Cape Cod Regional Policy Plan ("RPP"), District of Critical Planning Concern ("DCPC") implementing regulations, municipal development bylaws, and Commission-certified Local Comprehensive Plans ("LCP"). The Commission must also find that the probable benefit from the Project is greater than the probable detriment.

#### **MUNICIPAL DEVELOPMENT BYLAWS, LCP, AND DCPC CONSISTENCY REVIEW**

77. There are no DCPC implementing regulations applicable to the Project.
78. The Town's most recent Cape Cod Commission-certified LCP, from 2008, contains a detailed section on the Herring River Restoration Project, within the broader section on Natural Resources. The plan specifically lists "Complete Herring River Restoration project" as a natural resources goal and recognizes that completion of the project can help restore salt marsh and wetlands, which aligns with natural resources goals for the town. Additionally, the Project and its outcomes can support some of the six priority objectives of the 2008 LCP, including "protect and preserve water resource," and "protect and preserve our beaches and shorefront areas for recreation and industry."
79. The LCP also includes as a supporting document in its appendix the 2006 Wellfleet Harbor Management Plan, which recommends completion of the Herring River Restoration project. The Plan recognizes that restoring tidal flushing in the Herring River system can improve water quality in the Herring River and recommends development of a proposal for restoration of the Herring River (among other) tidal marshes and flats because restoring those marshes "is one of the most valuable steps that could be taken to maintain and enhance the quality of natural resources in Wellfleet Harbor."
80. It does not appear that discretionary zoning approvals are required for the Project, or that the Wellfleet zoning bylaw has particular application to the Project. In terms of local permits, licenses and approvals, the Applicant anticipates that the Project will require wetlands review and the issuance of Orders of Conditions by the Wellfleet and Truro Conservation Commissions, as well as administrative permits for road-work and construction.
81. The Project requires a variety of state and federal licenses, permits or approvals, including those related to CNR bridge construction, water quality and wetlands.

#### **CAPE COD REGIONAL POLICY PLAN CONSISTENCY REVIEW**

82. The Commission reviewed the Project subject to the 2018 RPP and companion Technical Bulletins. Under Section 9 of the 2018 RPP, the Commission determines the Project's consistency with the RPP by determining whether the Project is consistent with those goals and objectives from Section 6 of the RPP that are applicable, material and regionally significant with respect to the Project. The companion Technical Bulletins elaborate and interpret the RPP's goals and objectives.

83. The Commission's Committee on Planning and Regulation (Committee) issued a DRI Scoping Decision, dated March 7, 2019, for the Project pursuant to Section 5 of the Enabling Regulations. The DRI Scoping Decision establishes the following RPP goals and objectives as applicable, material and regionally significant with respect to the Project, and are included in this DRI review: the Coastal Resiliency Goal and Objectives 2 and 3; the Community Design Goal and Objective 3; the Cultural Heritage Goal and Objectives 2 through 4; the Transportation Goal and Objective 1; the Wetlands Goal and Objectives 1 through 4; the Wildlife and Plant Habitat Goal and Objectives 1 thorough 5; and Water Resources Goal and Objectives 1 through 4. For Water Resources Objective 4, and Wetland Resources Objective 3, the DRI Scoping Decision limited stormwater management review to that associated with water control structures and roadwork.
84. The Site is mapped as a "Natural Area" Placetype by the Commission under the RPP and has been treated as such for purposes of DRI review. The vision for the RPP Natural Area Placetype is to minimize adverse development impacts to sensitive resource areas, to preserve lands that define Cape Cod's natural landscape and contribute to its scenic character, and to improve the Cape's resilience to severe storms and the effects of climate change.
85. Per the RPP, development should be responsive to context allowing for the restoration, preservation, and protection of the Cape's unique resources while promoting economic and community resilience. In particular, RPP Natural Systems Goals and Objectives are to protect and restore the quality and function of the region's natural environment that provides the clean water and healthy ecosystems upon which life depends.
86. Subject to the Conditions set out in this Decision, the Project is consistent with the above-referenced RPP goals and objectives and with the corresponding provisions from the Technical Bulletins, as discussed in detail below.

### ***Coastal Resiliency***

87. The RPP Coastal Resiliency Goal is to prevent or minimize human suffering and loss of life and property or environmental damage resulting from storms, flooding, erosion, and relative sea level rise. Objectives include minimizing development in the floodplain, planning for sea level rise, erosion, and floods, and reducing vulnerability of built environment to coastal hazards.
88. The Project will increase community resilience to sea level rise by (1) providing new infrastructure with tide gates that will allow flexibility in managing the level of tidal flow through the entrance to the Herring River system at Chequessett Neck Road; (2) providing mitigation to protect upstream properties under extreme storm surge conditions; and (3) restoring the natural beneficial functions of coastal resource areas.
89. However, the Project is not intended nor designed to prevent or mitigate extreme coastal storm surges, which would overtop the proposed new Chequessett Neck Road structure. Similarly, the existing Chequessett Neck Road dike was not designed or constructed as a FEMA-designated flood control structure: the existing structure would not prevent impacts from the FEMA-defined 100-year storm surge.
- a. The new CNR structure proposed as part of the Project is designed to a similar crest elevation as the existing dike. Constructing a new structure at Chequessett Neck Road to prevent overtopping during the FEMA defined 100-year coastal storm would require a crest height three feet higher than proposed and would incur costs and impacts that would make the Project infeasible or undesirable. Further, designing the new Chequessett Neck Road structure as a FEMA flood control structure would be ineffective, because water would still be able to potentially enter the Herring River system under extreme storm surge conditions by overtopping dunes at Powers Landing and Duck Harbor; for surge conditions below the crest height of the proposed new structure, the bridge and tide gates, even fully open, would still effectively dampen tidal exchange and limit the height of storm surge into the Herring River.

90. Man-made artificial tidal restriction (primarily the construction and operation of the CNR dike) has impeded the important process of marsh sedimentation, which has contributed to marsh subsidence in the Herring River system upstream of the restriction. The restored marsh will act as a natural buffer to storms and wave action. It will also displace the existing methane-emitting freshwater wetlands and serve as a carbon sink that reduces greenhouse gases. Tidal restoration and other project activities will improve drainage of floodwaters following storm events.
91. The Town has considered alternatives and the project is a reasonable compromise between achieving beneficial coastal wetland restoration, providing public accommodations and facilities and access thereto, while protecting potentially impacted structures. The Town will continue to maintain this balance as the Project is administered through the HRAMP.
92. Objective CR2 is to plan for sea level rise, erosion, and floods. According to the DRI application, based on extensive hydrodynamic modeling, all new water control structures will accommodate sea level rise and allow for improved storm flow drainage. Proposed elevated sections of roads will allow for continued public access while protecting these road sections from inundation after tidal exchange is restored. Mitigation activities will follow construction best management practices, including erosion and sediment controls and vegetation restoration, to minimize impacts to surrounding wetlands that could be impacted during road construction.
93. Objective CR3 is to reduce vulnerability of the built environment to coastal hazards.
- The Project minimizes new development in coastal resource areas to that which is needed to allow for restoration and other public purposes while protecting impacted properties. There is existing development in the floodplain and the Project will include a combination of redevelopment (e.g. replacement of the existing undersized CNR dike), removal (e.g. portion of High Toss Road), and addition (e.g. Pole Dike and Mill Creek water control structures and elevation of low-lying roads) of structures in the floodplain to achieve overall restoration while protecting private properties.
  - The Coastal Resiliency Technical Bulletin allows for development in coastal resource areas to allow for restoration of salt marsh, fish runs, or shellfish beds; this Project aims to restore all these resources.
  - The Project proposes to replace existing infrastructure in the floodplain with more resilient infrastructure.
  - Two residential structures on properties acquired by the federal government will be removed and those sites will be incorporated into the restoration area.
  - A portion of High Toss Road which crosses the floodplain also will be removed to allow tidal flow, which is currently restricted by undersized culverts under the dirt roadway.
  - New Project development in the floodplain is designed to accommodate sea level rise.

### ***Community Design***

94. The Community Design goal of the RPP is to protect and enhance the unique character of the region's built and natural environment based on the local context. The relevant Community Design objectives is to avoid adverse visual impacts from infrastructure to scenic resources (CD3).
95. This Project does not contain the building and site design elements typical of many or most DRI projects. The majority of the Project's built or man-made elements will not be visible. The most significant built element (which has the highest visibility and thus the greatest potential for visual impact) is the new Chequessett Neck Road (CNR) bridge.
96. *Objective CD3 – Avoid adverse visual impacts from infrastructure on scenic resources*

Though the width of the CNR bridge is proposed to be increased to accommodate additional parking and pedestrian facilities, the bridge design has been careful to limit adverse visual impacts including by keeping the bridge elevation less than a half-foot above the existing level, by designing the viewing area separate from the roadway surface, and by burying the existing overhead utilities. Other water control structures and low-lying roadway work balances the retention of rural character with transportation safety and access improvements.

97. The new CNR bridge will be replacing a portion of the existing dike. It will be 165 feet long with adjustable tide gates and will include pedestrian access, viewing and fishing platforms, parking, and as part of the Project, the overhead utilities will be buried.
98. The new CNR bridge will also include enhanced parking, pedestrian access, and viewing/fishing platforms, improved stormwater management, improved access to the water, and improved aesthetics from burial of overhead utilities. The design of the new bridge was selected because it will be best suited to serve the restoration functions of the Project and meets necessary access standards, such as certain MassDOT requirements. The design of the CNR bridge was also selected based on input from CCNS and Wellfleet officials and local citizens. A series of alternatives for water access and portage design elements were evaluated for selection of a preferred approach in light of multiple design objectives including cost, ADA accessibility, resource area impacts and visual impacts.
99. The new CNR bridge will have a final surface elevation similar to the existing dike. Retaining the existing elevation of the roadway and structure to preserve rural character was a design objective of the Town's. The increased width of the new bridge is to allow for more public safety features such as sidewalks and a pedestrian walkway as well as amenities in the form of viewing areas, access to the water, the tide gate control mechanism and parking. The potential greater visual impact associated with a larger CNR bridge has been weighed and appropriately balanced with the aim of providing additional and improved public accommodations and facilities, and has been mitigated in its design.
100. The burying of utilities will also enhance the natural feeling and scenic views of the area. The town of Wellfleet Planning Board has designated this portion of Chequesset Neck Road on its list of scenic roads. The Project incorporates designs and practices to maintain the rural and natural character of this roadway, including in an appropriate design transition between the roadway and the CNR bridge itself.
101. Because of its nature and purpose, the Project will result, directly or indirectly, in visual changes to the area in the form of changes in vegetation and thus views as the restoration progresses, however these changes are consistent with the existing open, undeveloped and natural context and will improve or enhance the existing natural character of the area, such as the removal of the High Toss Road culvert and a restoration back to a natural state where High Toss Road crosses the Herring River currently. The Project proposes to preemptively remove much of the woody vegetation expected to be affected by tidal flow before it is killed by the saltwater to, among other reasons, avoid the visual impacts of dead trees and shrubs (most of this area is located within the CCNS and will be handled by its Fire Management crew. The Town will obtain permission from private property owners as necessary).
102. The Project proposes as mitigation elevating 10,850 linear feet of existing low-lying roadways to prevent flooding of these roadways. Raising these roadways "requires widening the road bases and replacing six existing culverts and installing the Pole Dike Road water control structure with tide gate." Some elevated sections of roadway may require increased guardrails along them and the reconstructed roadways may be slightly wider to improve safety. Steel-backed timber guardrails will be used, consistent with the desirable, existing rural character of the area.



103. The design of roadway improvements, as detailed in preliminary plans submitted in the DRI application, was developed in consultation with town citizens, town officials, Cape Cod National Seashore, and local and state regulatory agencies. Roadway design objectives included public safety, maintaining rural character, and minimizing disturbances to natural resources and wildlife mobility.
104. A widened roadway surface proposed for Chequessett Neck Road bridge will accommodate pedestrian and safety improvements such as a sidewalk, crosswalks, and a pedestrian walkway on the western side of the bridge adjacent to the viewing platform. Handicapped accessibility improvements are also incorporated into the design. Sidewalks will have wheelchair ramps equipped with detectable warning panels and transition ramps for accessing the pedestrian walkway and viewing platforms. An accessible walkway and boardwalk will be installed to provide access from the Duck Harbor parking area to the kayak and canoe launch on the upstream side of the bridge.
105. Preliminary plans for improvements to Pole Dike, Old County and Bound Brook Island Roads are included in the DRI application showing the use of steel-backed timber guardrails. The Project will consult with Police, Fire and Public Works Departments to determine the appropriate approach to striping and signage for these road segments. Road construction layouts are intended to increase safety for vehicular, bicycle and pedestrian traffic while retaining the existing rural character of the roadways. The elevation of low-lying road segments and/or addition of guardrails are also designed to accommodate wildlife crossings. High Toss Road is proposed to remain an unpaved road with timber guardrails as shown in preliminary plans included with the DRI application.
106. The Project will not result in significant new impervious surfaces relative to what exists today. Much of the supporting infrastructure will be built where infrastructure already exists, minimizing the amount of newly disturbed land for those purposes. Though there are natural or vegetated areas that will be disturbed during the construction of the Project, these are minimal given the scale of the Project, and will be restored after construction. The proposed parking lot near the Chequessett Neck Road bridge will be constructed of permeable or pervious pavers, again resulting in minimizing the amount of impervious surfaces, appropriate to context.

### ***Cultural Heritage***

107. The Cultural Heritage Goal is to protect and preserve the significant cultural, historic, and archeological values and resources of Cape Cod.
108. *Objective CH2 – Protect and preserve archaeological resources and assets from alteration or relocation*  
An archaeological assessment of the project area was done in 2011 by PAL Inc., and several additional areas were investigated as project plans developed, under permits from Massachusetts Historical Commission. Where the assessment identified areas of archaeological sensitivity, flood control structures or other treatment measures will help to protect those resources from possible erosion. A Programmatic Agreement between the Massachusetts Historical Commission and the National Park Service specifies that work will be avoided in areas of archaeological sensitivity wherever possible. This will allow the Town and CCNS to review potential impacts to archaeological resources from increased tidal flow and altered shorelines. If impacts to archaeological resources are projected as tidal intrusion increases, further archaeological testing will be required under the Agreement, and presumably there would be an opportunity to develop flood control structures or mitigation may be modified to protect specific significant locations.
- a. The potential for archaeological resources were identified on portions of the CYCC property. In coordination with Massachusetts Historical Commission and professional archaeological consultants, methods were identified to prevent disturbance of these resources and to better ensure

their long-term protection in light of proposed Project property mitigation work. Land disturbance and site work that moves forward on that property will require a permit from the State Archaeologist/Massachusetts Historical Commission.

*109. Objective CH3 – Preserve and enhance public access and rights to and along the shore*

The proposed design for the Chequesset Neck Road bridge includes several elements to maintain or increase public access to the shore, with sidewalks for pedestrians, stairs for portage of kayaks and small boats, and parking spaces and seating for scenic viewing.

*110. Objective CH4 – Protect and preserve traditional agricultural and maritime development and uses*

The proposed tidewater restoration will improve water quality for shellfishing in the area, a traditional maritime and agricultural use.

### ***Transportation***

111. The overall Transportation goal of the RPP is to provide and promote a safe, reliable, and multi modal transportation system. The Project will enhance transportation safety with the construction of a new Chequessett Neck Road bridge and roadway and culvert improvements on several vulnerable local roadways which will be impacted by the restoration project. The Project also aims to improve multimodal accommodations, where applicable, and accommodate all modes of travel during construction activities.

112. Objective TR1 relates generally to safety (*Improve safety and eliminate hazards for all users of Cape Cod's transportation system*) and therefore applies to the proposed roadway construction activities associated with the Project.

113. Any transportation network impacts associated with the Project, including roadway reconstruction and replacement of culvert structures on vulnerable low lying roadways and the construction of the new Chequessett Neck Road bridge, will be temporary and mitigated through the use of Maintenance Protection of Traffic Plans (MPOT) developed for all proposed roadway construction associated with the Project (see plans in DRI application Section 8 Attachment H). The affected roadways are classified as local roadways and generally do not carry heavy traffic volumes.

114. These traffic management plans maintain safe vehicular, bicycle and pedestrian access during all stages of construction. The MPOTs were developed by the Project team to safely accommodate traffic during construction activities and will be reviewed and approved by local officials or MassDOT, or both, as appropriate, for the affected roadways. The Maintenance Protection of Traffic (MPOT) plans include considerations to address potential safety impacts associated with roadway connections to Route 6 during construction. The MPOTs were prepared in accordance with the Federal Highway Manual of Uniform Traffic Control Devices (MUTCD) and MassDOT standards and work will be performed in various stages to manage traffic flow.

115. An MPOT specific to the Chequessett Neck Road bridge was prepared and proposes to maintain traffic flow during construction by use of a temporary one-lane bridge with sidewalk that will operate under a temporary traffic signal to accommodate alternating one-way traffic flow. The traffic management plan for construction of the Chequessett Neck Road bridge will be reviewed and approved by public safety officials, and will be made available for public comment prior to being finalized. The Project, in consultation with local public safety officials, will incorporate into the plan signage and other appropriate measures for bicyclists and pedestrians using the temporary bypass bridge during construction to enhance safety.

116. Overall, the new CNR bridge will improve the safety of the transportation network by accommodating pedestrians with new sidewalks and crosswalks. Formal on-street parking spaces as well as a new gravel lot will be connected with a new concrete sidewalk to be constructed as part of the Project. A bridge permit for the CNR bridge will be required from MassDOT.
117. During reconstruction activities for the two low-lying paved roadways of Pole Dike Road and Bound Brook Island Road, traffic will be detoured off these roadways (except for local traffic and access to the transfer station). The proposed detours for these two roadways include diverting traffic via adjacent local roadways including a detour along Route 6 for a small section. Detour plans for low road construction will be reviewed and approved by public safety officials, and will be made available for public comment prior to being finalized. Safety considerations for the two detour plans will include: (a) connections to Route 6 during construction (b) possible alternate bicycle routes, and (c) timing of construction to minimize disruption to residences and businesses. A communications plan will be developed and implemented to ensure that year-round and seasonal residents are aware of detour routes and any pedestrian/bicycle accommodations.
118. All road work will be coordinated with appropriate Town staff to manage traffic flow during construction and minimize disruption. All homes and businesses that rely on the roads for access will have safe access during all stages of construction. To the extent practicable, construction work will be conducted during non-peak times of the year, from October through April. Any changes to traffic management plans and MPOs resulting from input from local officials, emergency responders, public stakeholders, the project team or contractors will be incorporated into final construction documents.
119. A portion of High Toss Road will be removed as part the project. Since High Toss Road is a very low volume dirt road, overall impacts are limited to a small area. Traffic management for High Toss Road can likely be accommodated with the contractor using standard MPOT setups or limited police details/flagmen.
120. The proposed plans and profiles sheets for proposed elevation of the two low-lying roads indicate the travel lane widths will be increased from 10.5 feet to 11 feet with three-foot unpaved shoulders to enhance safety. Approximately 11,500 lineal feet of steel backed timber guardrail will be installed as necessary based on MassDOT guidance to enhance safety for the increased side slopes on the elevated roadways.
121. As stated in the DRI application, based on input from the local police department, the speed limit on these roadways is currently 40 miles per hour (mph), but is unposted. The Town proposes to decrease and post the speed limit to 35 mph; there is a formal process in coordination with MassDOT for speed zoning that the Town will have to coordinate before implementing this change.
122. Local Police, Fire and Public Works Departments have been consulted on road design issues and will continue to be consulted to determine the appropriate approach to striping and signage for the elevated low road segments, and these details will be incorporated into final roadway design plans and construction protocols.

### **Wetlands**

123. The Project aims to restore the quality and natural values and functions of the Herring River consistent with this RPP Wetlands Resources Goal to protect, preserve, or restore the quality and natural values and functions of inland and coastal wetlands and their buffers. The over-arching goal of the Project is to restore a degraded wetland resource area, and the development of water control infrastructure and mitigation activities will protect wetlands through construction best management practices.

124. A purpose of the Cape Cod Commission Act is to further the conservation and preservation of the natural undeveloped areas of Cape Cod.
125. The 2018 RPP recognizes high quality natural systems, including wetlands, as part of Cape Cod's attraction for residents and visitors. These wetland resources support much of the plant and wildlife that makes the Cape such an environmentally rich and interesting place. In addition, wetlands play a vital role in regulating the environment by absorbing and filtering storm and flood waters, providing natural removal of nitrogen, recharging the aquifer, storing carbon in wetland peat and vegetation, and providing vital habitat.
126. The RPP encourages measures to restore altered or degraded wetlands, including restoration of tidal flushing. Of note is the RPP Wetlands Resources Goal of restoring the quality and natural values and functions of inland and coastal wetlands and their buffers.
127. As the Project area is all within wetlands jurisdiction, it will be subject to review and permitting under federal, state and local wetlands regulations.
128. The Massachusetts Wetlands Protection Act allows for tidal restoration projects that restore salt marsh (even if such projects require direct alteration, loss or conversion of jurisdictional wetlands to achieve restoration goals) and corresponding regulations include a definition of Ecological Restoration (310 CMR 10.04) – a project whose primary purpose is to restore or otherwise improve the natural capacity of a resource area(s) to protect and sustain the interests identified in M.G.L. c. 131, section 40, when such interests have been degraded or destroyed by anthropogenic influences. Public interests include flood control, prevention of pollution and storm damage, and protection of public and private water supplies, groundwater supply, fisheries, land containing shellfish, and wildlife habitat. Ecological Restoration projects include infrastructure replacements to remove tidal restrictions and projects that will restore fish passage and shellfish and rare species habitat.
129. It is ultimately within the jurisdiction of Massachusetts Department of Environmental Protection and the local Conservation Commission to make determinations regarding whether the restoration plan qualifies as an Ecological Restoration project under Wetlands Protection Act regulations as the Project undergoes state and local wetlands review. The Project is facially consistent with the Ecological Restoration definition in that it is a project whose primary purpose is to restore the natural capacity of a resource area to protect and sustain public interests that have been degraded or destroyed by anthropogenic influences.
130. The ecological restoration plan itself will result in the temporary or permanent loss of wetland resource areas or conversion of one wetland resource area to another. The loss or conversion is necessary to achieve the project's ecological restoration goals. The potential impacts have been extensively studied and modeled and identified flood impacts for the built environment will be mitigated. Adverse impacts to resource areas and the interests of the Wetlands Protection Act will still need to be minimized and avoided during the relevant local wetlands reviews and permitting; for example, through erosion and sediment control best management practices during construction activities.
131. While impacts to existing wetlands will occur due to construction of project elements, the overall wetlands benefits of the restoration outweigh these localized and short-term impacts. The benefits include the general restoration of wetland resources and the riverine ecosystem and improved wildlife, fisheries and storm damage prevention functions of the free-flowing river.
132. The Project will result in changes to existing wetlands, wetland buffers, and hydrology. However, the current wetlands, wetland buffers, and hydrology are the result of construction of the dike and other man-

made modifications that resulted in significant alterations and degradation to the entire Herring River system for the past 100 years. Section 4.B.1.2 (Wetland Habitats and Vegetation) and Table 4.1 of the application (as revised April 17, 2020) provide current and proposed estimates of areal extents of wetland types according to a Sea Level Affecting Marshes Model (SLAMM) developed for the Project. Consistent with the analysis presented in the DRI application and supplemental application filing, the revised table 4-1 shows a dramatic change in dominant vegetation types from non-tidal wooded swamp, shrub-scrub wetlands, and fresh emergent marsh (totaling approximately 434 acres in the existing Phase 1 project area) to saltwater dependent marshes.

133. The revised table 4-1 demonstrates that there will be no loss of wetland area and significant improvement to overall wetland function. Although the SLAMM output indicate that salt marsh habitat will increase from about 64 to 256 acres, both the functionality and quantity of salt marsh is expected to improve and increase by much larger degrees for two primary reasons. First, of the existing 64 acres recognized as 'salt marsh' in SLAMM, a large portion, approximately two-thirds, is dominated by the non-native invasive species common reed (*Phragmites australis*). Tidal restoration, especially in the Lower Herring River, will largely eliminate this species and allow the reestablishment of highly productive native salt marsh cord-grass (*Spartina alterniflora*). Second, because SLAMM did not incorporate marsh accretion processes, the model is biased toward lower elevation wetland types and is overestimating the future coverage of tidal flats and subsided marsh surfaces. Large portions of these areas, totaling 259 acres of projected wetland habitat, will either accrete through natural marsh building processes or will be actively managed by the project to achieve the inter-tidal surface elevation, relative to restored tidal exchange, needed to support native estuarine plant communities. Therefore, actual coverage of salt marsh as a result of Phase 1 is expected to be approximately 350 acres, higher than the 256 acres indicated in revised table 4-1.
134. As noted in the DRI application, the Herring River SLAMM outputs are not precise projections of future wetland habitat types; however, these model projections illustrate general habitat changes (i.e., from non-tidal to tidal marsh) and are useful for targeting zones for potential vegetation and marsh management actions. The Mill Creek, Duck Harbor, and Pole Dike Creek sub-basins will also experience transitions in wetland types with increases in salt-tolerant types and decreases in less salt-tolerant types.
135. RPP Wetlands Objectives are to: 1) protect wetlands and their buffers from vegetation and grade changes, 2) protect wetlands from changes in hydrology, 3) protect wetlands from stormwater discharges, and 4) promote the restoration of degraded wetland resource areas.
136. Due to the nature and purpose of the Project (i.e. programmatic public restoration of a degraded wetland system rather than discrete, traditional building development in proximity to wetland resources), Objective WET4 (promote the restoration of degraded wetland resource areas) is most pertinent RPP Wetlands Objective to the Project:
  - a. The Herring River wetland system has been shown to be degraded and the proposed restoration will improve the natural wetland functions, restore native vegetation, and improve habitat for native species.
  - b. Restoration will enhance natural coastal processes, functions, and sediment movement and improve habitat for native plant and wildlife species.
  - c. The replacement structure is designed to improve fish and shellfish habitat and fish passage.
  - d. Some infrastructure will be removed from flood hazard areas (e.g. High Toss Road causeway), while some structures will remain and/or be installed to protect public and private properties (e.g. Pole Dike Road and Mill Creek water control structures).
  - e. Invasive species (i.e. *Phragmites*) will be removed.

137. RPP Wetland objectives, as discussed further in the Wetlands Technical Bulletin, aim to avoid adverse impacts to wetland resources associated with traditional development activities. The proposed changes to these wetland resources are necessary to meet the overall restoration purposes. As such, Objectives WET1, WET2 & WET3 only apply in the context of project water control infrastructure and mitigation activities.
138. Objective WET1 is to protect wetlands and their buffers from vegetation and grade changes. In general, alteration of a wetland is not consistent with the Objective. However, the Wetlands Technical Bulletin identifies exceptions to the prohibition including changes to existing development in wetlands and buffers provided the changes reduce impacts to and improve the functions of the wetland. Wetland and buffer alterations may be allowed where wetland resource values are not degraded, there is an overriding public benefit, and the impacts are minimized and mitigated. The existing undersized dike will be replaced with a new water control structure that will allow for greater tidal exchange and improved wetland function and will accommodate natural wetland migration. The mitigation activities include changes to other existing surrounding developments that are needed to allow for the restoration to proceed. As such, the water control infrastructure and mitigation activities fall under this exception.
- a. Herring River wetland resource values are currently degraded and construction and operation of new water control infrastructure is necessary to restore wetland functions and values. Some existing wetlands will remain in an altered state due to proposed mitigation activities; however, the extent of the proposed impact will not exceed the extent of improvement. Impacts from proposed alterations and mitigation activities will be minimized and mitigated through construction best practices including erosion and sediment controls and implementation of operations and maintenance and resource management plans.
139. Objective WET2 is to protect wetlands from changes in hydrology. Proposed changes to hydrology, in terms of increased tidal exchange, are necessary to meet the restoration purposes and restore historical hydrology. The water control infrastructure installation and mitigation activities will result in increases in impervious areas; however, these will be mitigated with improved stormwater management and treatment systems and vegetated swales, and will not significantly or adversely affect system hydrology.
140. Objective WET3 is to protect wetlands from stormwater discharges. As noted above, stormwater runoff from mitigation activities including changes to roads and culverts will be managed with improved stormwater management systems and vegetated swales, where no stormwater management is present currently.

### ***Wildlife and Plant Habitat***

141. The RPP Wildlife and Plant Habitat Goal is to protect, preserve, or restore wildlife and plant habitat to maintain the region's natural diversity. RPP Wildlife and Plant Habitat Objectives include maintaining existing plant and wildlife populations and species diversity, restoring degraded habitats through use of native plant communities, protecting and preserving rare species habitat, managing invasive species, and promoting best practices to protect wildlife and plant habitat from adverse development impacts. As with Wetlands Resources, the over-arching goal of the restoration is to restore degraded habitats.
142. The Project will change the extents of different habitat types in the project area, with an increase in salt marsh and a decrease in fresh water and uplands, and that these changes will result in changes to the distribution of existing plants and wildlife in the project area. However, the existing fresh water and upland habitats are altered states that developed after the CNR dike was installed and other alterations were made to Herring River system and the project aims to restore the system to a more natural salt marsh state that is less impacted by man-made structures and alterations.

143. The DRI application provides summaries of inventories for species including estuarine fish, shellfish and other macroinvertebrates, anadromous/catadromous fish, and rare, threatened and endangered species. As part of the permitting process, the project proponents are required to complete a National Oceanic and Atmospheric Administration Essential Fish Habitat review, U.S. Fish and Wildlife Service Section 7 consultation, and Natural Heritage and Endangered Species Program review; two federally-listed and eight state-listed species occur in the project area. In addition to these rare species, more common species of resident and migratory birds, mammals, reptiles, and amphibians occur in the Herring River project area.
144. Over the long-term, restoration will result in improved conditions for fish, shellfish, and estuarine macroinvertebrates. The state-threatened diamondback terrapin will also benefit from the restoration. There will be mixed results for other rare species. Impacts to rare species will be assessed by state and federal agencies and mitigation measures and conditions of those assessments must be incorporated into project construction best management practices and HRAMP.
145. As with wetland types, associated wildlife types will shift as a result of the project. Species dependent on estuarine wetlands will become more abundant, while species dependent on woodland, shrubland, or heathland will become less abundant. Because the restoration will be gradual, the shift in wildlife species composition will also be gradual. Adequate habitat types for rare and common species is expected to remain in the Project area and the restoration benefits from being within the CCNS and less densely populated areas of the Outer Cape where there are suitable wetland and upland habitats in the surrounding area for displaced species to inhabit. There will be some gradual shifts in habitats and species distributions, however, the Project will restore overall ecosystem balance to the Herring River.
146. Objective WPH1 is to maintain existing plant and wildlife populations and species diversity. Staff notes that the project supports this Objective overall by restoring native habitat in the Herring River system. This Objective also promotes the minimization of natural vegetation clearing. New clearing of vegetation is particularly discouraged in Natural Area Placetypes. There would be new clearing for the proposed 82,800 square foot (1.9 acre) staging and parking area, as there is no other practicable alternative.
- a. The existing downstream parking area is a dirt/gravel area use by shellfishermen and others for recreational purposes. This parking area is outside of the limit of disturbance for the Project and there is no proposed alteration of the existing downstream parking area. However, concerns about erosion impacts on this parking and access way due primary to vehicle access have been noted in the past.
  - b. The Cape Cod National Seashore is assessing whether management alternatives to reduce erosion impacts are feasible. It is possible that the creation of a new parking access area at the proposed staging area on the upstream side of the new CNR bridge structure may help to alleviate use of the downstream parking area.
  - c. The upstream staging area was selected as a preferred option based on a calculation of staging area needed to safely and efficiently accommodate the size and amount of equipment and materials needed during construction, and the relatively level topography of the site.
  - d. The option of closing Chequessett Neck Road and using the paved roadway for staging area was not selected due to the desire to keep the road open to emergency and other vehicles, pedestrians and bicyclists during construction.
  - e. The Town sand pit located off High Toss/Pole Dike Roads is another potential staging area, though further from the construction site. The Project team will work with the selected contractor to maximize use of disturbed area at the sand pit for staging to the extent feasible and thereby minimize impacts to natural resources areas at the upstream staging area.
  - f. Following construction, the upstream staging area will be replanted with native vegetation and used as parking access for kayak portage. The upstream parking area will provide more convenient access for kayakers, including an accessible path and launch area. The provision of safe access for portage

was a priority design objective expressed by local officials and stakeholders early in the design process.

147. Objective WPH2 is to restore degraded habitats through use of native plant communities. The Project proposes to restore native salt marsh habitat, plant native plants in areas disturbed by construction, and remove invasive Phragmites. The Project will compile a set of consistent best practice for site restoration, seeding and replanting, and will incorporate the best practices, including the use of native seed mixes, into final construction documents and bid specifications.
148. Objective WPH3 is to protect and preserve rare species habitat. According to the DRI application materials, the Applicant is coordinating with the Natural Heritage and Endangered Species Program on the development of a Habitat Management Plan for potentially impacted state-listed species, which plan will be integrated with the HRAMP. As noted above, changes in tidal flow will be gradual and incremental allowing for upland and fresh water dependent rare species to relocate to surrounding habitat and for salt marsh dependent species to recolonize. The construction best management practices to be compiled and finalized by the Applicant and will help minimize impacts of development on rare species habitat.
149. There are at least two certified vernal pools in or proximate to the project area – one is near the intersection of Pole Dike and Coles Neck Roads in Wellfleet and one is off Old County Road in Truro. Project activities will occur within the 350-foot buffer of the vernal pool in Wellfleet. Work here involves raising the road to allow for continued public access while protecting the road from inundation after tidal exchange is restored. There is no work proposed to occur within the 350-foot buffer to the vernal pool in Truro. Elevation of Low-Lying Roads is proposed in the 350-foot buffer to the vernal pool in Wellfleet; however, the road is at a lower elevation than the vernal pool and perimeter controls will be set up prior to any work being done. The Project will ensure that it provides, inspects and maintains adequate erosion and sediment controls during construction, and will abide by any regulatory conditions to regularly inspect the protective measures. The Project also will work with the Cape Cod Commission, Conservation Commissions and Natural Heritage and Endangered Species Program to ensure that (1) the timing of construction does not interfere with species dispersal periods; and (2) project design incorporates measures to accommodate species dispersal (e.g., tunnel crossing), if needed during construction or in perpetuity.
150. Objective WPH4 is to manage invasive species. A probable benefit of the project is the removal of existing stands of invasive Phragmites. Removal may occur gradually through displacement as the salt marsh is restored, and/or manually. Invasive species management will be considered as part of the project's Vegetation Management Plan integrated into the adaptive management plan.
151. Objective WPH5 is to promote best management practices to protect wildlife and plant habitat from the adverse impacts of development. Construction best management practices discussed in the preceding Wetlands Resources section will be protective of wildlife and plant habitat.

### ***Water Resources***

152. The Water Resources goal of the RPP is to maintain a sustainable supply of high-quality untreated drinking water and protect, preserve, or restore the ecological integrity of Cape Cod's fresh and marine surface water resources.
153. The Project does not involve the water quality issues the Commission more typically deals with during DRI review, such as the generation of new nitrogen loads through wastewater and other traditional development activities, and the corresponding potential impacts on groundwater and drinking water resources. The Project is not located in a wellhead protection area or potential public water supply area. One of the primary purposes of the Project is to remediate the conditions leading to Herring River's



designation as an Impaired Water. Despite proposing no wastewater generation or water use/withdrawal within the project site, the increase in tidal range expected in Herring River does have some potential to change where fresh and saline groundwater interface in the subsurface, which was the focus of the Commission's review under Water Quality Objective WR1, which deals with protecting and preserving groundwater quality.

154. The Town has provided a review of groundwater dynamics in areas adjacent to estuarine systems, as well as a detailed analysis of seven private wells that could potentially be impacted by the Herring River Restoration. Two wells are expected to be abandoned when the properties on which they are located are acquired by the National Park Service. Permission has been granted by two additional property owners to relocate their wells as part of the project. A third well is also proposed to be relocated, and discussions with the property owner are ongoing. In the event that permission to relocate the well is not granted, a physical barrier would be constructed to prevent tidal inundation of adjacent properties would also prevent saltwater inundation of this well. No changes are proposed to two additional wells, as the respective elevations of the wellheads and screened intervals indicate that water quality will not be negatively impacted and may be improved by having increased tidal exchange in Herring River. The assumptions used to identify wells potentially subject to impact from the Project, based on both their horizontal proximity to the project restoration extents and elevation relative to expected water levels, are conservative in nature. The proposed mitigation measures for private wells are appropriate and sufficient under Objective WR1 to avoid adverse impacts to low-lying drinking wells.
155. Also relevant to DRI review under Objective WR1 are anticipated changes to groundwater elevation as a result of the proposed project that may also hold the potential to mobilize contaminants in the subsurface that are associated with the Town's capped landfill. The Applicant has provided a technical memo (The Johnson Company, 2019) in the DRI application stating that landfill leachate has been reduced and/or stopped, and that there is no longer a contaminated groundwater plume emanating from the landfill site. Analytical results however show the presence of detectable 1,4-dioxane in downgradient well CSAW-1D, and a trend of increasing 1,4-dioxane concentrations between 2014 and 2017. The presence or absence of contaminants in landfill leachate is outside of the scope of this DRI review. That particular question is being addressed by town-sponsored monitoring of groundwater beneath the landfill.
- a. For the purposes of this DRI review, the relevant question is whether tidal restoration will cause an alteration in the level or flow direction of groundwater under the landfill. Evidence provided by the Town supports the position that tidal restoration will not alter groundwater elevations or the direction of groundwater flow under the landfill. A significant increase in mean surface water elevation in the vicinity of the landfill would be needed to make a case that tidal restoration would increase the water table elevation and thereby increase the thickness of the freshwater zone. However, in the case of the Project, tidal restoration will not result in surface water being any closer to the landfill than it is today, which is already a distance greater than 500 feet. Therefore, tidal restoration also will not alter the water table elevation or the thickness of the freshwater zone beneath the landfill, will not alter the flow direction of groundwater beneath the landfill, and thus will not potentially mobilize contaminants from the landfill.
156. The Project is not in a freshwater recharge area, so Objective WR2 is not applicable.
157. Under Objective WR3, the Commission reviews a project's impacts on Marine Water Resource Areas. The Commission's interest under the Objective is typically mitigating nitrogen impaired waters or avoiding further nitrogen impairment. The Project poses different circumstances than the typical development project the Commission reviews under its DRI jurisdiction: the Project is not fundamentally a traditional building or structural development project; does not involve wastewater generation or turf fertilizer use (and their corresponding nitrogen loads); and its new nitrogen loads associated with stormwater are relatively low, and proposed stormwater treatment mitigates those loads. The Project is, however, located in the Marine Water Recharge Area for Wellfleet Harbor, a water body that is considered nitrogen impaired.

158. By providing better stormwater treatment than under existing conditions, not generating or disposing of wastewater, and not creating any fertilized turf areas in the Project Site the proposed project is expected to reduce the amount of nitrogen reaching Wellfleet Harbor via the controllable sources typically considered during Regional Policy Plan analysis.
159. More apropos to the circumstances associated with the Project, there exists some potential for the overall restoration project to change the behavior of nitrogen and other nutrients throughout the entire Herring River system, through reintroduction of saltwater to currently drained wetland soils, and conversion of freshwater marsh area to saltwater marsh. The reintroduction of saltwater to drained marsh sediments through increased tidal exchange has been shown to potentially re-mobilize nitrogen (as ammonium), but this phenomenon is expected to be temporary and will be the subject of specific monitoring as part of the HRAMP.
160. Similarly, the long-term nitrogen impact of restoring saltwater marsh area has not been evaluated in detail and may not even be possible to evaluate at this time. The complex nature of the proposed restoration and the ecosystem at its heart- and the challenges in predicting the timing, duration, and magnitude of these potential changes to nutrient dynamics- highlight the utility and necessity of a carefully constructed monitoring and adaptive management plan that can track changes in the system and provides a framework for decision-making based on those observed changes. The HRAMP explicitly includes minimizing excess nitrogen export to Wellfleet Harbor shellfish beds as measured by ammonium concentrations near aquaculture areas, and minimizing fecal coliform levels, as sub-objectives to HRAMP Fundamental Objective #3 (Minimize Adverse Impacts).
161. By reducing the amount of controllable nitrogen from stormwater, by improving stormwater treatment to remediate the bacterial point source condition that exists at the Chequesset Neck Road bridge, and by providing monitoring with a sufficiently detailed adaptive management plan that considers and responds to potential short- and long-term changes to nitrogen dynamics in the Herring River system, the Project is consistent with Objective WR3.
162. Evaluation of the Project relative to stormwater Objective WR4 has been undertaken only in the vicinity of discrete project elements and roadwork mitigation activities where addition or modification to existing impervious surfaces are occurring, consistent with the terms and conditions of the DRI Scoping Decision for the Project. These elements include the Chequesset Neck Road bridge replacement, Pole Dike Road water control structure, elevation of High Toss Road, and elevation of low-lying road crossings and culverts. Based on the enhancements that will be made to the various stormwater management systems the Project is consistent with Objective WR4, which deals with stormwater management, quality and treatment.
- a. CNR Bridge: The existing CNR dike and roadway do not utilize any formal stormwater management, and runoff from the road surface flows into Herring River / Wellfleet Harbor with minimal treatment. This untreated stormwater is considered a point source of bacteria to nearby shellfish beds by MA DMF and is a primary contributor to the listing of Herring River as a bacterially impaired water. The installation of the Chequesset Neck Road bridge and tide control structures will create an additional 5,119 square feet of impervious area compared to the existing conditions, but will also significantly enhance the level of stormwater treatment provided. The proposed bridge design incorporates a stormwater management system consisting of vortex separator inlets as pre-treatment, vegetated stormwater planters to provide water quality treatment and allow for infiltration of stormwater runoff. The system has been designed to collect and treat the required water quality volume generated by the new bridge structure and roadway approaches.

- b. High Toss Road / Hopkins Drive: Proposed mitigation work at High Toss Road consists of raising the grade of High Toss Road and adding level spreaders during associated earthwork to minimize erosive flow of runoff and promote infiltration. This represents an improvement in drainage conditions over the current situation which is generally unmanaged. Hopkins Road is currently paved with six leaching catch basins to manage runoff from the roadway, and a portion of Hopkins Road will also be raised to meet the new grade of High Toss Road. Between the new grading of Hopkins Road and the replacement of leaching catch basins with deep sump hooded catch basins followed by drywells or subsurface infiltration chambers, runoff from Hopkins Drive which could erode the High Toss Road roadway surface is expected to be minimized. The upgraded drainage systems on Hopkins Road are both expected to provide a modest increase in contaminant removal compared to the current drainage system, as well as enhanced ability to manage and infiltrate stormwater runoff to prevent negative impacts to High Toss Road and adjacent wetland resources.
- c. Elevated low-lying roads: Within the overall project area there are approximately 24,500 linear feet of roadway, of which approximately 10,850 linear feet will require elevation as part of the Project's mitigation measures. Sections of Pole Dike Road, Bound Brook Island Road, and Old County Road will be both widened and elevated, resulting in an overall increase in impervious area and associated runoff. The Project proposes along with these roadway modifications to add vegetated conveyance swales where site conditions permit, which will provide better management of roadway drainage and mitigates the effects of the increases in impervious surface associated with widening the road widths.

#### **REGIONAL BENEFITS/DETRIMENTS**

163. Probable benefits of the Project identified include:

- Reconnecting the Herring River estuary to Cape Cod Bay and the Gulf of Maine to recover the estuary's functions as: (1) a nursery for marine animals; (2) a source of organic matter for export to near-shore waters and (3) a natural coastal food web to support numerous fish and bird species and other wildlife that depend on healthy coastal marsh habitats and processes for their migration and survival.
- Reopening waterways to improve migration and spawning for a variety of fish species including River Herring, American Eel, Striped Bass and Winter Flounder, as well as Diamondback Terrapin (a state-listed reptile species).
- Enhancing habitat to increase local fin-fish production.
- Removing physical impediments to migratory fish passage to restore once-abundant river herring and eel runs.
- Protecting and enhancing harvestable shellfish resources both within the estuary and in receiving waters of Wellfleet Harbor, which in addition to natural resource benefits, will benefit the local economy and employment.
- Enhancing coastal resiliency by restoring normal sediment deposition needed to allow the marsh to gain elevation and mitigate impacts of sea level rise, and by constructing state-of-the-art tidal control infrastructure to protect low-lying roads and other structures.
- Re-establishing the estuarine gradient of native salt, brackish, and freshwater marsh habitats in place of the invasive non-native and upland plants that have colonized most parts of the degraded floodplain.
- Enhancing opportunities for canoeing, kayaking, wildlife viewing and engaging with the natural world over a diversity of restored wetland and open-water habitats including 6 miles of waterways for recreation and tourism and general physical well-being.
- Generating an estimated approximately \$624 million in local and regional economic benefits over the life of the Project based on economic studies of other similar coastal restoration projects.
- Combating the adverse effects of climate change naturally by returning lost carbon storage volume and reducing methane emissions from deteriorated salt marsh.

- Re-establishing the natural control of nuisance mosquitoes by restoring tidal range and flushing to conditions that are not conducive to mosquito habitat, and by increasing access for fish that prey on mosquito larvae, especially virus-bearing species.
- Prudent, community-centered infrastructure planning and investment with a methodical approach to replace the Chequessett Neck Road bridge and address the associated effects of increased tidal exchange prior to the eventual failure and obsolescence of the existing structure.
- A unique opportunity to restore and reverse the negative effects of development on a floodplain system and its natural beneficial function, which is not always otherwise available because of ownership and control issues, and the extent of floodplain development over time.

164. Probable detriments of the Project identified include:

- There is an existing human community within the Herring River floodplain and estuary system: there will be varying degrees of impact on a number of developed private properties in the system. While proposed flood protection measures or mitigation will protect against potential impacts of Phase 1 tidal flow on structures, other changes, i.e. vegetation changes, could alter the respective owners' use and enjoyment of those properties.
- There will be temporary and permanent impacts to existing wetlands resources and habitat as the Herring River system transitions from its current state to the native coastal wetlands system it was historically.

## CONCLUSION

Based on the Findings above and subject to the Conditions set out below, the Commission further determines, finds, and concludes that: the Project is consistent with the 2018 Cape Cod Regional Policy Plan, applicable provisions from the Wellfleet LCP, and applicable municipal development bylaws; the probable benefit of the Project is greater than the probable detriment; and the Commission hereby grants DRI approval for Phase 1 of the Herring River Restoration Project described herein.

## CONDITIONS

1. This Decision shall be final when the appeal period set out in Section 17 of the Cape Cod Commission Act has elapsed without appeal (or if such an appeal has been filed, when the appeal has been finally settled, dismissed, adjudicated, or otherwise disposed of in favor of the Applicant). Thereafter, this Decision shall be valid and in effect, and municipal development permits may be issued pursuant to this Decision. The Project presents a comprehensive, long-term municipal water quality improvement program within the meaning of Section 13b of the Commission Act and accordingly there is no time limit, seven years or otherwise from the date of this Decision, in which the Town must obtain its municipal development permits, licenses and approvals for the Project.
2. A copy of this Decision, when final, shall be filed with the Barnstable Registry of Deeds.
3. The Applicant shall obtain all required municipal development permits for the Project; consistency with applicable municipal development bylaws shall be ratified and confirmed by the Applicant obtaining all required municipal development permits for the Project.
4. The Applicant shall provide the Commission notice of having obtained any particular federal, state or local permit, license or approval required for the Project when said permit, license or approval is final: the Applicant shall provide the Commission copies of said permits, licenses, or approvals, and corresponding permit plans, upon request.
5. Increased tidal exchange in Phase 1 shall not exceed a maximum mean high tide elevation in the Lower Herring River of 3.6 feet NAVD88 or a maximum mean high tide elevation in the Mill Creek subbasin during Mean High Water Spring (MHWS) of 2.5 feet NAVD88. The Town shall undergo further review by the Commission to authorize further Project phases and tidal exchange beyond these limits.

6. The Mill Creek, Chequessett Neck Road (CNR) and Pole Dike Road water control structures shall be constructed and operable when Phase 1 tidal restoration commences, i.e. when the tide gate openings at the proposed Chequessett Neck Road water control structure cause the volume of tidal water flowing in and out of Herring River to exceed the volume of tidal water flowing in and out of Herring River under existing conditions.
7. All mitigation work on specific public or private property during Phase 1 tidal restoration (as described and proposed in the DRI Application and the plans provided in Appendix 8.H, or as otherwise provided in written agreements with respective property owners), on the public and private properties identified in Appendix 8.H shall be in place prior to any potential impact from Phase 1 tidal restoration on said affected properties (i.e. based on project monitoring and/or project modeling of surface and/or groundwater indicating that the portion of the property for which mitigation is proposed would potentially experience project-caused impacts from Phase 1). The mitigation work shall be completed in accordance with the plans provided in Appendix 8.H of the DRI Application (or as otherwise provided for in written agreements with respective property owners).
8. If, after the date of issuance of this decision, the proposed scope, form, location, or timing of mitigation differs substantially from that proposed in the DRI application, the Applicant shall notify the Commission before such mitigation begins.
9. The Project shall be undertaken, operated and maintained in accordance with the Herring River Adaptive Management Plan (HRAMP). A preliminary version of the HRAMP was submitted as Attachment 8B in the DRI application: the final version of the HRAMP shall be provided to the Commission when it is prepared, prior to the initial operation of the tide gates at the Chequessett Neck Road Bridge.
10. The Applicant shall maintain and regularly update with greater detail and specificity, when available, the Project framework and estimated schedule of Phase 1 key activities/ responsibilities, which was provided to the Commission in preliminary form in the supplemental DRI application filing dated April 17, 2020 (a copy of which is attached to this decision as Exhibit A). The Applicant should provide the updated Project framework document to the Commission as and when available, but at a minimum annually. Among other information, updates should include details about timelines for preparation of final project construction plans and submission of them to the Commission, and scheduling related to proposed mitigation work for structures on public and private properties.
11. Consistent with the specific guidance provided in Finding 66 of this Decision, the Applicant shall provide the Commission, when prepared, the final construction-level Project plans, including final versions of those design-level plans submitted in Attachment 8H of the DRI application, as well as a compilation of environmental construction BMPs for the project. The environmental construction BMP compilation shall be included in bid specifications for the Project and provided to Project contractors. In addition, the Applicant shall furnish the Commission with copies of plans and reports as they are prepared, including the Phase 1 Sediment Management Plan, Stormwater Management Plan, Stormwater Pollution Prevention Plan, and Water Control Plan.
12. The Commission will coordinate with the Applicant to establish a process for the request and issuance of Certificate/s of Compliance at the completion of identified Project stages or milestones; this process may be incorporated into the Project framework document discussed in the Condition above. The purpose of the Certificate/s of Compliance is to confirm and evidence that the Project or a component thereof has been undertaken in accordance with this Decision.

13. The Applicant hereby authorizes Commission staff to make site visits as necessary, at reasonable times and upon reasonable notice to the Applicant, to confirm that the Project has been implemented in accordance with this Decision, including upon the Applicant's request for a Certificate of Compliance hereunder.
14. Given the comprehensive, long-term and programmatic nature of the Project, the Commission recognizes and anticipates the inherent potential and need for adjustments in design and implementation over the course of the Project. It is the Commission's intent that such adjustments within the general scope of this decision and the Project as described under this decision can be made through the mechanism of HRAMP review and decision-making, and updates to the Project's key activities and responsibilities framework document, without the need for Modification to this Decision. In the event of an anticipated adjustment, the Applicant shall consult with Commission staff to determine whether a Modification to the decision is necessary to authorize such adjustment. Further, there may be activities within the areal extent of the Project pursued by the Town over time that are outside the Commission's jurisdiction established under this Decision because such activities are unrelated or not sufficiently related to the Project, and thus do not require any review under or potential Modification to this decision.

***SIGNATURE PAGE FOLLOWS***

**SIGNATURE PAGE**

Executed this 17<sup>th</sup> day of June 2020

For the Cape Cod Commission by:

Harold W Mitchell  
Harold Mitchell, Chair

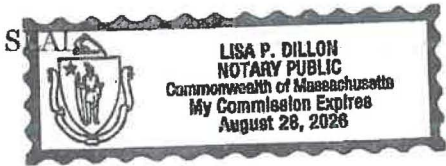
**COMMONWEALTH OF MASSACHUSETTS**

Barnstable, ss

June 17, 2020

Before me, the undersigned notary public, personally appeared Harold Mitchell, whose name is signed on the preceding or attached document, and such person acknowledged to me that he signed such document voluntarily for its stated purpose in his capacity as Chair and on behalf of the Cape Cod Commission. The identity of such person was proved to me through satisfactory evidence of identification, which was [ ] photographic identification with signature issued by a federal or state governmental agency, [ ] oath or affirmation of a credible witness, or [X] personal knowledge of the undersigned.

Lisa Dillon  
Notary Public  
My Commission Expires: 8/28/2026



**EXHIBIT A**  
**HRRP Phase 1 Key Activities/ Responsibilities**  
**Preliminary Draft- Submitted April 17, 2020**

**[Attached]**



Herring River Restoration Project Phase 1 Key Activities, Responsibilities 2020-2027								
Key Activities	Calendar Year							
	2020	2021	2022	2023	2024	2025	2026	2027+
<b>Permitting and Fundraising (Ph 1)</b>	<b>Permitting &amp; Fundraising</b>							
I. Permitting								
A. Cape Cod Commission DRI								
B. Section 401 Water Quality Certificate								
1. Sediment Management Plan								
2. Tide Gate O&M Plan								
C. Sec. 404 Individual Permit								
D. Ch. 91 Waterways License and Permit								
E. MZM Consistency Determination								
F. US Coast Guard Non-applicability Determination								
G. Wellfleet & Truro Orders of Conditions								
H. Other permits (per DRI application Section 1.E)								
II. Develop HREC Approved AMP								
A. Initial Tide Gate Operating Policy								
B. Vegetation/ Marsh Management Plan								
C. NHESP approved Habitat Management Plan								
D. Monitoring, Modeling, Analysis, Reporting								
III. Low-lying Property Mitigation, Agreements								
IV. Draft Traffic Management Plans & MPOT								
V. Final Engineering Design for WCS and Mitigation								
A. Site restoration planting plan								
VI. Fundraising Ph 1								
VII. Governance and Oversight								
A. Herring River Executive Council (qtrly mtgs)								
1. Herring River Technical Team Advisory Input								
2. Herring River Stakeholder Group (qtrly mtgs)								
B. Regulatory Oversight Group								
C. Grants Management and Reporting								
D. Project Management								
<b>Bidding &amp; Construction (Ph 1)</b>	<b>Bidding &amp; Construction Ph 1</b>							
VIII. Develop bid specs/bidding process								
A. Contractor(s) selection								
1. Finalize Traffic Management Plan, MPOT								
a. Submit changes to permitting agencies								
2. Water Control Plan								
3. NPOES GP soil mgmt, erosion control plan								
IX. Construct class 1 elements								
A. Water control elements								
B. Low-lying Property Mitigation								
C. Construction management								
1. Sediment Management Class 1								
2. Water Control								
3. Soil, erosion control								
4. Traffic Management								
5. Site restoration								
X. Implement/ Update AMP as needed								
A. Pre-rest Veg, Marsh Management Actions								
B. Monitoring, Modeling, Analysis, Reporting								
<b>Tidal Restoration &amp; Adaptive Management (Ph 1)</b>	<b>Tidal Restoration &amp; Adaptive Management</b>							
XI. Implement/ Update (as needed) AMP								
A. Tide Gate Management/Restoration								
1. Tide Gate O&M								
B. Post-rest Vegetation, Marsh Management								
C. Sediment Management Class 2								
D. Monitoring, Modeling, Analysis, Reporting								

