Cape Cod Water Resources Restoration Project

Plan Review and Implementation Update

Prepared by: Cape Cod Conservation District

For the USDA Natural Resources Conservation Service

The Cape Cod Conservation District acknowledges the expertise and technical support of the Project Sponsors and Project supporters. The Cape Cod Conservation District is proud to lead this partnership improving water quality for shell fishing areas, improving/restoring anadromous fish spawning areas and enhancing/restoring salt marshes.

January 2022

Photos

Top left - Stormwater Treatment (grassed channel, formerly known as biofilter swale) in Brewster, Massachusetts

Top Right – New culvert at Crosby Lane serving the saltmarsh in Brewster, Massachusetts

Bottom Left – Fish ladder at the historic Baxter Grist Mill in Yarmouth, Massachusetts

Bottom Right - New Bridge over the Parkers River on Route 28 serving the estuary in Yarmouth, Massachusetts

Cape Cod Conservation District is an equal opportunity provider and employer

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All basic data provided to NRCS in a portable hard drive.

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Executive Summary

The Cape Cod Conservation District (Conservation District) is proud to be the lead Sponsor of the Cape Cod Water Resources Restoration Project (CCWRRP). The Conservation District has worked continuously since 2002 with all 15 towns, Barnstable County, Massachusetts Division of Marine Fisheries, Massachusetts Division of Ecological Restoration (all Project Sponsors) and other local partners to plan and implement the CCWRRP which is funded by the USDA Natural Resources Conservation Service (NRCS). The extra efforts by the Conservation District have been critical to the success and continued strong public and political support for the Project.

The 2009 Congressionally authorized Cape Cod Water Resources Restoration Project Final Watershed Plan and Areawide Environmental Impact Statement (Plan/EIS) identified 76 priority projects that were expected to enhance/restore 1,500 acres of salt marsh, improve/restore 4,200 acres of fish spawning areas, and improve water quality in 7,300 acres of shell fishing areas. The 76 priority projects listed in the Plan/EIS are not the final list of projects that may be implemented under the Cape Cod Water Resources Restoration Project. Selection of final projects depend (1) on which projects are brought forward for final assistance by the towns or EOEA and (2) on the results of a final, detailed evaluation of each site, including costs and environmental impacts and benefits. The Plan/EIS states that new sites may be proposed by the local organizations. A new site would be evaluated first by NRCS through the screening/ranking process described in Plan/EIS Section 6.1, and if it ranks within the range of the sites currently on the priority list, it would be added to the list and become eligible for assistance.

Since 2009, partial funding of the CCWRRP has been provided and incremental progress has been made. However, although the Plan/EIS was authorized by Congress in 2009, it was written in 2006 based on data collection and analysis performed in 2002-2005. Many projects were successfully implemented, and lessons have been learned to select, plan and implement projects. NRCS requested the Conservation District to document the progress to-date, evaluate the Plan/EIS's ability to meet current needs, identify the remaining Sponsor priority projects and costs to complete the Plan, emphasizing the projects providing the most benefits. Although Wellfleet's Herring River salt marsh restoration project Sponsors are seeking multiple funding sources, NRCS also indicated that the costs for Wellfleet's Herring River salt marsh restoration project should be included, since none have been confirmed at this time. This report summarizes the process the Conservation District used, the remaining Sponsors' priority projects and their estimated costs that will accomplish the overall described goals and objectives.

The watershed agreement and watershed project plan are the official documents for carrying out a watershed project. Whenever the terms, conditions, and stipulations of a watershed project plan must be modified, approval of such changes will be made and documented with a revised or supplemental watershed plan, by an exchange of correspondence with the sponsoring local organizations (SLOs), or by executing a project agreement.

Additionally, the National Environmental Policy Act (NEPA) requires that supplements to existing EIS be prepared if substantial changes in the proposed action that are relevant to

environmental concerns, or there are significant new circumstances or information relevant to environmental concerns that have bearing on the proposed action or its impacts.

The Conservation District does not recommend any changes in the Plan/EIS. The Plan/EIS's potential effects will be addressed in the site-specific documentation on Form NRCS-CPA-52, "Environmental Evaluation Worksheet" to determine if that particular site needs an Environmental Evaluation or an Environmental Assessment or its individual Environmental Impact Statement. NRCS Part 610 of the National Environmental Compliance Handbook provides a checklist (Part 610.134 NEPA Supplementation Review and Documentation Checklist) to determine if a supplemental EIS is needed. The completed NEPA Supplementation Review and Documentation Checklist is in Appendix A.

The Sponsors' current needs and objectives are consistent with the authorized Plan/EIS. The Updated Priority Sites do not change the purpose, scope, or environmental effects already analyzed in the original Plan-EIS or its major features. There isn't any change in SLO or its responsibilities or cost sharing arrangements or contracting as set forth in the watershed agreement. Therefore, a revised watershed project plan or a supplemental watershed project plan is not required

Approximately 96 restricted salt marsh sites were evaluated to select the 16 recommended updated priority projects. The 148 restricted fish passage sites were evaluated to select the 31 recommended updated priority projects. The 129 stormwater sites were evaluated to select the 51 projects recommended updated priority projects.

Fourteen (14) previously constructed stormwater projects and four (4) salt marsh projects were evaluated to determine if the desired improvements in water quality (stormwater) and tidal hydrology (salt marsh) are being obtained. The general conclusion is that the desired objectives are being achieved.

The updated Plan/EIS Table 2 project costs were based on the historical construction costs of completed projects updated to 2021 dollars (ENR). Other federal and nonfederal costs are based on the percent of construction costs as defined in the Plan/EIS. The total Project costs are estimated to be $279,450,000 and are shown in Appendix H.

Project Background

The Cape Cod Water Resources Restoration Project Final Watershed Plan and Areawide Environmental Impact Statement (Plan/EIS) were combined into a single document and was authorized by Congress in 2009.

The purposes of the Project[1/] are to restore degraded salt marshes, restore anadromous fish passages, and improve water quality for shellfishing areas. Specifically, sponsors wish to:

- Improve tidal flushing in salt marshes where man-made obstructions (i.e., road culverts) have restricted tidal flow. This will help restore native plant and animal communities in salt marshes and improve biotic integrity.

[1/] We use "Project" in this Plan-EIS to refer to the areawide Cape Cod Water Resources Restoration Project and "project" to refer to individual site restoration or remediation activities; the Project comprises 76 projects.

- Restore fish ladders and other fish passages that have deteriorated. This will allow greater numbers of anadromous fish (which spend most of their adult lives in salt water and migrate to freshwater streams, rivers, and lakes to reproduce; for example, alewife, blueback herring) to gain access to spawning areas, and support greater populations of other species (for example, striped bass, bluefish, weakfish, largemouth bass, chain pickerel) that depend on them for food.
- Maintain and improve water quality affecting shellfish beds by treating stormwater runoff. This will help ensure that shellfish beds which are threatened with closure remain open and maintain or extend the current shellfishing season for beds whose use is restricted during certain times of year.

This Project is needed because human activity on Cape Cod has degraded its natural resources, including salt marshes, anadromous fish runs, and water quality within shellfish growing areas. The development of Cape Cod has required the construction of extensive road and railroad culverts or bridges that cross streams, rivers and tidal marshes. Many of the openings through these structures are not large enough to allow adequate tidal flushing or fish passage. When the culverts or bridges constrict flow, the tidal regime changes, which results in vegetation changes over time; what was once a thriving salt marsh can become a brackish or fresh water wetland dominated by invasive species.

Human activity on Cape Cod has also resulted in damming or diverting streams, causing anadromous fish to lose access to spawning grounds. In addition, water flow may have been altered by cranberry growers and other farmers. Fish ladders and other fish passage facilities have been built to help ensure that fish get access to spawning areas, but these structures deteriorate over time (end of design life), or they may be of obsolete design and need replacement to function properly.

Cape Cod's economy depends on good water quality. Shellfishing, a multi-million-dollar industry on the Cape, is only allowed in areas with excellent water quality. As land is developed, and more areas are paved, stormwater runoff may become contaminated with nutrients, metals, fertilizers, bacteria, etc. This runoff can carry enough fecal coliform bacteria to affect water quality in shellfishing areas, thus leading to closure of shellfishing areas, or restrictions on the periods when the beds can remain open. By controlling sources of runoff, separating clean water from contamination sources, and capturing and treating the most heavily contaminated runoff through a variety of measures (e.g., infiltration, constructed wetlands), this Project will help to maintain or improve water quality in shellfish areas.

The Cape Cod Conservation District (Conservation District) , Barnstable County Commission, all 15 towns in Barnstable County, and the Executive Office of Environmental Affairs (EOEA) are the Project sponsors. They represent the local residents who requested the assistance from the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS), to address the problems described above. Within EOEA are CZM and DMF, which are the lead state agencies for regulating shellfishing and anadromous fisheries. Both CZM and DMF provided technical data, information, and guidance in preparing the CCWRRP Plan/EIS.

The Plan/EIS identified 76 priority projects that were expected to enhance/restore 1,500 acres of salt marsh, improve/restore 4,200 acres of fish spawning areas, and improve water quality in 7,300 acres of shell fishing areas.

The 76 priority projects listed in the Plan/EIS are not the final list of projects that may be implemented under the Cape Cod Water Resources Restoration Project. Selection of final projects depend (1) on which projects are brought forward for final assistance by the towns or EOEA and (2) on the results of a final, detailed evaluation of each site, including costs and environmental impacts and benefits. The Plan/EIS states that new sites may be proposed by the local organizations. A new site would be evaluated first by NRCS through the screening/ranking process described in Plan/EIS Section 6.1, and if it ranks within the range of the sites currently on the priority list, it would be added to the list and become eligible for assistance.

The Plan/EIS Project benefits are in non-monetary terms of habitat units. This benefit is displayed in the National Ecosystem Restoration (NER) Account in lieu of the traditional National Economic Development (NED) Account.

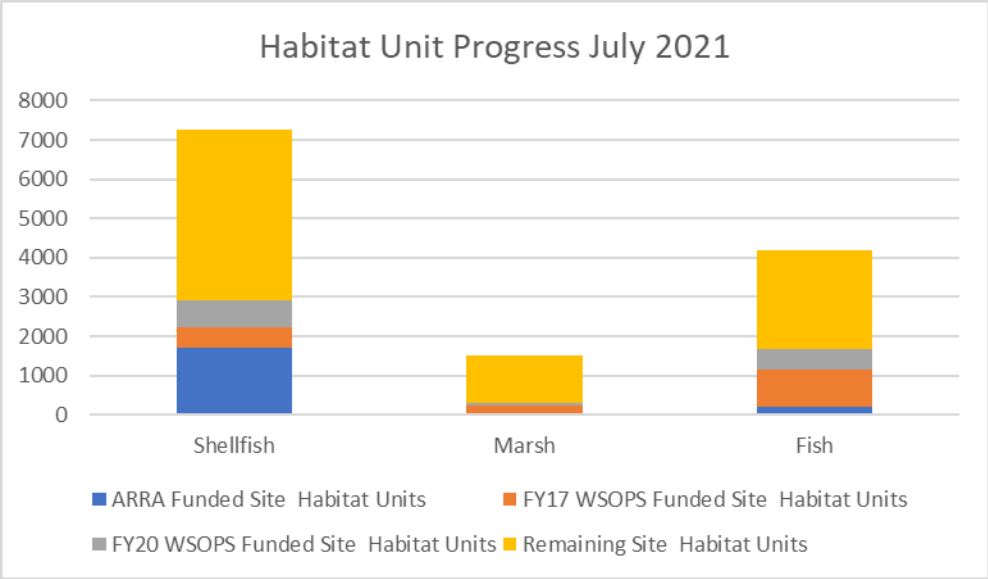
The plan was prepared under the authority of the Watershed Protection and Flood Prevention Act, Public Law 83-566, as amended (16 U.S.C. 1001-1008) and in accordance with Section 102(2)(c) of the National Environmental Policy Act of 1969 (NEPA), Public Law 91-190, as amended (42 U.S.C. 4321 et seq.). Responsibility for compliance with NEPA rests with NRCS as the implementing federal agency. The innovative scope of the project required NRCS to approve several adaptations of agency policies to fit the scope within the requirements of Public Law 83-566 and the agency's implementing regulations (7 CFR 622) as follows:

- Define the project area not by typical topographic watershed delineation, rather, it includes all of Barnstable County except the Massachusetts Military Reservation (Figure 2-1).
- Determine that improvements to shellfish beds would provide agricultural benefits and, therefore, NRCS could provide technical and financial assistance for installing measures on non-agricultural lands to address non-agricultural stormwater discharges to treat runoff prior to entering shellfish areas.
- Determine that NRCS could provide technical and financial assistance for installing measures to restore existing anadromous fish runs, which increase the food fish for other species for sport and commercial harvesting.
- Determine that NRCS could provide technical and financial assistance for installing measures to restore tidal flow to restricted salt marshes, which restore plant and finfish ecosystems in salt marshes.
- Determine that NRCS could assist in addressing the stormwater issues if the sponsors addressed the on-site septic system issues in areas where the pollutant source affecting shellfish beds is a combination of stormwater and on-site septic systems. Also determine that the sponsors' costs to address the on-site septic system issues would be an acceptable in-kind contribution towards their cost share for addressing the stormwater issues.
- Concur in the use of the U.S. Army Corps of Engineers' (USACE's) methodology to determine project benefits in non-monetary terms of habitat units. This benefit is displayed in the National Ecosystem Restoration (NER) Account in lieu of the traditional National Economic Development (NED) Account. The Office of Management and Budget has accepted USACE projects justified using an NER account.

- The scope of the Cape Cod Water Resources Restoration Project falls under the purpose of Watershed Protection, conservation & proper utilization of land, land treatment. The proposed measures to address project objectives are all land treatment measures under watershed protection and can be cost shared at rates commensurate with other programs.
- The proposed measures to address project objectives will be installed by sponsoring towns or sponsoring state agency. Implementation will be through cooperative and or contribution agreements.
- Measures to restore the salt marsh ecosystems include replacing culverts with larger culverts and enlarging bridges, although associated with transportation infrastructure (roads, bridges, culverts, railroads, etc.), are eligible for PL 83-566 technical and financial assistance.

Appendices A, B and C summarize the status of these original 76 priority sites. The following displays the progress made towards the Project Purposes.

Table A Habitat Units Summary July 2021							
Objective	Plan Priority	ARRA Funded	FY17 WSOPS Funded	FY20 WSOPS Funded	Total Habitat Units	Percent Towards Goal	Remaining Habitat Units
Shellfish	7264	1693	540	695	2928	40.3%	4336
Marsh	1497	48	193	50	291	19.4%	1206
Fish	4191	187	969	521	1677	40.0%	2514



Reason for Plan Update

Since 2009, partial funding of the CCWRRP has been provided and incremental progress has been made. However, although the Plan/EIS was authorized by Congress in 2009, it was written in 2006 based on data collection and analysis performed in 2002-2005. Besides 26 projects being successfully implemented, lessons have been learned to select, plan and implement projects. NRCS requested the Conservation District to:

- Document status of the original 76 priority sites
- Evaluate the Sponsor needs and determine if revisions are needed to the Plan/EIS
- Identify the remaining Sponsor priority projects
- Determine funding needed to meet the Project objectives
- Emphasize projects providing the most benefits

NRCS also indicated that the costs for Wellfleet's Herring River salt marsh restoration project should be included, since no other sources of funding have been confirmed at this time (the Wellfleet's Herring River salt marsh restoration project Sponsors are seeking multiple funding sources). This report summarizes the process the Conservation District used, the remaining Sponsors' priority projects and their estimated costs that will accomplish the overall described goals and objectives.

Watershed Project Plan Modifications (National Watershed Program Manual Part 503)

The watershed agreement and watershed project plan are the official documents for carrying out a watershed project. Whenever the terms, conditions, and stipulations of a watershed project plan must be modified, approval of such changes will be made and documented with a revised or supplemental watershed plan, by an exchange of correspondence with the sponsoring local organizations (SLOs), or by executing a project agreement.

A revised watershed project plan is required if new problems that require Federal assistance are identified or there are numerous complex changes in the planned measures.

A supplemental watershed project plan is a document that changes the purpose, scope, or a major feature of an existing plan. The conditions requiring modification by a supplemental watershed project plan include changes in project purposes, scope, major features or SLO responsibilities not significant enough to warrant a revised watershed project plan. The amount of detail included in a supplemental plan depends on the nature and extent of the modifications and their effect on the overall project.

Conditions requiring modifications by a supplemental watershed project plan include:

1) Change in Purpose. —Defined as the addition or deletion of one or more purposes from an approved watershed project plan.

2) Change in Scope. —Defined as a planned increase or decrease in the degree or extent of project development.

3) Change in Major Features. —Defined as either of the following:

   i. Achieving agreed-upon objectives through changed methods without changes in purpose or scope.

   ii. Adding provisions for Watershed Program credit assistance.

The Updated Priority Sites do not change the purpose, scope, or environmental effects already analyzed in the original Plan-EA or Plan-EIS, or its major features. There isn't any change in SLO or its responsibilities or cost sharing arrangements or contracting as set forth in the watershed agreement. Therefore, a revised watershed project plan or a supplemental watershed project plan is not required.

NEPA Compliance

In November 2006, the Natural Resources Conservation Service (NRCS) completed the Final Watershed Plan and Areawide Environmental Impact Statement for the Cape Cod Water Resources Restoration Project (Plan/EIS). To ensure that the proposed actions under the Cape Cod Water Resources Restoration Project (CCWRRP) and Areawide Environmental Impact Statement (EIS) is still valid, a review of USDA-Natural Resources Conservation Service (NRCS) National Watershed Program Manual (NWPM), Part 503, and the National Watershed Program Handbook (NWPH), Part 603) was completed. The review determined that neither a revised watershed project plan or a supplemental watershed plan is required to be prepared. No new problems that require Federal assistance have been identified nor are there numerous complex changes in the planned measures. There are no changes in project purposes, scope, major features or Sponsor responsibilities. Therefore, there are no modifications or changes to the proposed actions that have a bearing on environmental effects require that a supplemental Plan-EIS be prepared.

Additionally, the National Environmental Policy Act (NEPA) requires that supplements to existing EIS be prepared if substantial changes in the proposed action that are relevant to environmental concerns, or there are significant new circumstances or information relevant to environmental concerns that have bearing on the proposed action or its impacts.

The EIS for the CCWRRP Plan is an areawide EIS. As each project site is proposed for implementation by a local sponsor, it will be evaluated in more detail to determine if the design assumed for this planning-level study is the most feasible and effective. Other feasible and effective alternative designs will be considered. The impacts and benefits of each project will be evaluated in more detail in an Environmental Evaluation (EE) tiered to this EIS. This EE is documented in form NRCS-CPA-52. Specific permitting requirements will be identified in the EE for each specific project.

There have been no changes made in the Plan/EIS or its potential effects which will not be addressed in the site-specific documentation on Form NRCS-CPA-52, "Environmental Evaluation Worksheet" to determine if that particular site needs an Environmental Evaluation or an Environmental Assessment or its individual Environmental Impact Statement.

The Updated Priority Sites do not require a revised watershed project plan or a supplemental watershed project plan. NRCS Part 610 of the National Environmental Compliance Handbook provides a checklist (Part 610.134 NEPA Supplementation Review and Documentation Checklist) to determine if a supplemental EIS is needed. The completed *NEPA Supplementation Review and Documentation Checklist* is in Appendix D.

Process for Updating Priority Project Sites

The Conservation District continues as the lead Project Sponsor. The Conservation District worked closely with the NRCS, Massachusetts Division of Marine Fisheries (DMF), Massachusetts Division of Ecological Resources (DER), Cape Cod Cooperative Extension, Barnstable County Coastal Resources Sub-committee, all 15 towns, and the Association to Preserve Cape Cod (APCC) to identify potential priority restoration sites. The goal of the plan formulation process is to maximize National Ecosystem Restoration (NER) benefits (measured as habitat units) at the least cost.

The Conservation District used this partnership to collect input town by town on their priority restoration projects. Also, towns provided input on the existing ranking criteria and on revisions to the criteria. This resulted in a secondary ranking criteria used to prioritize the list of eligible sites. The COVID 19 Pandemic impacted the efficiency of data collection and virtual Zoom, or MS Team meetings were used to meet with town staff and partners. The list of projects was vetted with each town to confirm the feasibility of pursuing these projects. Each town reviewed their list of potential projects and had an opportunity to add projects which they rank highest as a town priority. Sites were dropped if they could not be feasibly restored, if local interest was low or moderate, or if restoring tidal flow would adversely affect septic fields or private wells. Conservation District has periodically kept the Barnstable County Coastal Resources Sub-committee apprised of the general update activities. The Conservation District then worked with NRCS to refine the list of sites to the 2021updated priority projects shown in Appendices E, F and G. The following provide more detail for each resource objective.

Stormwater

The Conservation District, through discussions with town officials and DMF, identified 129 sites as potential stormwater restoration projects for implementation of stormwater best management practices (BMPs). The process included meetings with each town's representatives from the Department of Public Works, Engineering Department, Shellfish Constable and Natural Resource staff, Conservation Agents and in some towns, members of the Board of Selectmen and town administrators. Each town came into the meeting with prepared lists of stormwater sites that impact shellfish water quality and habitat.

DPW staff provided the infrastructure and physical runoff problems, while the Natural Resource/Conservation staff offered insights into the ecological and economical value of bivalve shellfish and habitat below the identified outfalls. The town's local expertise and experience prioritized the sites based on their perception of importance.

Conservation District used the Plan/EIS criteria to evaluate these sites for stormwater remediation eligibility. Through a collaborative process, each site was then ranked using a secondary ranking criterion developed by the MA Division of Marine Fisheries, the Barnstable

County Coastal Resources Sub-committee, NRCS and the Conservation District. This secondary ranking provides an updated look at projects to ensure that the final set of projects selected take into account the newest and best available information when considering both the ecological value and feasibility of the restoration project.

The 129 stormwater outfall sites were evaluated to select the 49 recommended updated priority projects. Stormwater project construction costs were based on the historical construction costs of completed projects updated to 2021 dollars (ENR). Other federal and nonfederal costs are based on the percent of construction costs as defined in the Plan/EIS. The estimated costs are shown in Appendix E.

Fish Passage

Massachusetts Division of Marine Fisheries (DMF) maintains and tracks a Diadromous Fish Habitat Restoration Priority List. Initially DMF conducted a survey in 2001 and 2002 to collect information on the present state of fish passage in Massachusetts coastal streams and rivers and help guide future restoration efforts. Statewide, the survey covered 215 coastal streams; 493 lakes, ponds, or reservoirs; and 380 obstructions to migratory fish passage. It also included discussions with regional biologists, harbormasters, and local herring and shellfish wardens. The survey now identifies 148 existing fish passage structures in Barnstable County (originally 93 structures were identified). It demonstrates that Massachusetts has a large investment in fish passage along the coastal rivers and streams. DMF recommended numerous projects that should be undertaken over the next several years. These projects included the repair and/or re-design of failing or inefficient existing fishways and the construction of new fishways to provide access to additional spawning grounds.

The 148 fish passage sites were ranked by DMF using 13 criteria (developed by the DMF anadromous fish biologists) that assessed relative ecological, economic, and social importance as well as the practicality of providing or improving fish passage on Cape Cod. The Conservation District also discussed the projects with each town to confirm the feasibility of pursuing these projects. Each town reviewed their list of potential projects and some added projects that were not included but which they rank highest as a town priority. Sites were dropped if they could be addressed by the town or DMF or if town/DMF interest is low. Any new sites proposed by the towns were added to the list with eligibility and ranking scores for comparison. The highest-ranking sites were identified as potential priority fish passage restoration projects by the Conservation District and NRCS. The Conservation District worked with NRCS to evaluate the list of potential projects and based on the collective professional judgement and local knowledge selected the best sites to collect field data to verify feasibility and develop estimated construction costs.

The following basic field data and photos of the recommend projects:

- Town:
- River:
- Site Name:
- Location
- Description:
- Type Fishway Material (Concrete, CMP)
- Condition (Good, Fair, Poor)
- Size, Length, Number of Baffles
- Vertical Rise ft

The 148 restricted fish passage sites were evaluated to select the 29 recommended updated priority projects. Fishway construction costs were based on the type of fishway (steeppass, pool & weir, denil) and their historical completed project construction costs updated to 2021 dollars (ENR). Other federal and nonfederal costs are based on the percent of construction costs as defined in the Plan/EIS. The estimated costs are shown in Appendix F.

Salt Marsh

The Conservation District, through discussions with town officials, DER and APCC, compiled the existing data for salt marsh projects from Plan/EIS Table B-1 with the other inventories to determine the present state of coastal marshes to guide potential restoration efforts.

The Plan/EIS criteria was used to evaluate these sites for eligibility. The remaining sites were then ranked using a secondary ranking criterion developed through a partnership with DER, DMF, the Cape Cod Cooperative Extension, the Cape Cod Coastal Resources Subcommittee, the MassBays Cape Cod Regional Coordinator, and the Cape Cod Commission. This secondary ranking criterion looks at resilience to sea level rise, salt marsh migration potential, potential benefits to impaired (303d list) water bodies, impacts to low lying properties and extent of restriction as well as considering the ecological value and feasibility of the restoration project.

Each town reviewed their list of remaining potential projects and some added projects that were not included but which they rank highest as a town priority. Sites were dropped if were completed or which towns indicated were no longer a priority. Any new sites proposed by the towns were added to the list with eligibility and ranking scores for comparison. The highest-ranking sites were selected to collect field data to verify feasibility and develop estimated construction costs.

The following basic field data and photos was collected of the recommend projects:

- Type Culvert (CMP, Concrete)
- Condition (Good, Fair, Poor)
- Size/Dimensions
- Length
- Flap/Tide Gate (yes/no and status)
- Road height above bottom of culvert invert (ft)
- Utilities (overhead lines, buried water, sewer, etc)
- Guard rails (yes/no)

Photos:

- CL stream looking towards Marsh from road
- CL stream looking towards Ocean from road
- CL road looking left
- Cl road looking right
- Culvert Marsh side
- Culvert Ocean side

The salt marsh project list was sorted down from 173 projects to the 13 recommended updated priority projects. The size of the proposed culvert to provide full tidal flow was based on 3.5

square feet of opening per 1.0 acre of upstream effected area. The 3.5 SF/AC is the average of completed projects on the Cape. Construction costs were developed using RS Means cost tables and Massachusetts DOT cost tables. Other federal and nonfederal costs are based on the percent of construction costs as defined in the Plan/EIS. The estimated costs are shown in Appendix G.

It is noteworthy to mention the Herring River project in Wellfleet accounts for 55% of the Project salt marsh restoration acres and 37% of the total Project costs. The Herring River marsh restoration project is complex and is one of the largest tidally-restricted estuaries in New England. Engineering design and environmental reviews are well underway to prepare the Project for construction. Additional information can be found at: https://friendsofherringriver.org/

Adaptive Management

Risk and uncertainty are expected and inherent in a watershed plan. Each project has a certain level of risk and uncertainty associated with it, which may change the overall costs or benefits of the project. Ecosystem restoration is not an exact science; stormwater remediation measures and salt marsh restoration measures have risks and uncertainties associated with their final outcomes. Adaptive management is commonly used for such ecosystem restoration projects because of these risks and uncertainties.

Some of the probable risks and uncertainties identified in the Plan/EIS for stormwater remediation measures and salt marsh restoration are:

Salt marsh restoration projects

- Presence of improvements (e.g., wells, septic tanks) around marshes could make implementation of specific projects impossible or more expensive than estimated
- Local opposition from adjacent property owners could prevent implementation of specific projects.
- More detailed modeling and field surveys may be required to define project effects on adjacent properties accurately.
- Adaptive management may show that enhancing or restoring tidal flow has not restored the salt marsh habitat as expected, and some additional work may be necessary such as additional interior channels.

Stormwater remediation projects

- Adaptive management may show that proposed facilities are less effective than thought, the proposed number of treatment facilities may not provide the expected efficiency removals for existing fecal coliform loads, or other toxic compounds (e.g., metals, PCBs, pesticides) may be causing impairment to shellfish beds and more expensive treatment methods are required.
- Construction costs may increase because of site-specific factors unknown at this time, e.g., underground utilities requiring relocation.

Adaptive management is collecting and applying the information gained from monitoring the installed works of improvement to ensure that the planned habitat unit benefits are obtained.

Adaptive management is also applying the information gained from monitoring to the design of new project sites.

Adaptive management for fish passage obstruction remediation projects was not included in the Plan/EIS. DMF and Sponsors monitor the completed fishways and provide any adaptive measures to ensure successful fish passage. The Plan/EIS does include adaptive management for stormwater remediation projects and for salt marsh restoration projects.

The Conservation District met with DMF shellfish biologists and reviewed the water quality sampling data collected by DMF. Stormwater remediation measures on nine (9) of the 14 completed sites showed a reduction in fecal coliform indicating that the desired improvements in water quality are being achieved. The five (5) sites that were inconclusive to fecal coliform reduction need a larger sample size to determine trends. Also, some additional inspections are needed to determine if improvements in maintenance measures are warranted.

Based on the success of the completed projects there aren't any recommended changes to best management practices to improve water quality for shellfish areas. The Conservation District has an agreement for DMF to provide technical staff for monitoring water quality of shellfishing areas where the CCWRRP implements water quality improvement measures. This monitoring data is used to document the success of the projects or the need for additional measures needed to obtain the desired benefits.

The Conservation District contracted APCC to evaluate the completed salt marsh sites and APCC prepared a thorough report documenting their findings. The report is in the portable hard drive provided to NRCS. The report details the results of long-term monitoring of four tidally restored salt marsh on Cape Cod (Freemans Pond in Brewster, Red River in Harwich, Sesuit Creek in Dennis, and Sunken Meadow). The report reviews conditions pre- and post-restoration and assesses how the sites are changing in the years following restoration to determine the success of the restoration and make recommendations for actions to improve the outcomes of these and future tidal restoration projects. The overall goal of tidal restoration projects is salt marsh recovery in the formerly restricted marsh

The report concluded that the salt marsh restoration projects generally successful and have achieved the goals of restoration or are on a positive trajectory. APCC also identified factors that are impeding progress toward recovery and made recommendations for adaptive measures to improve the restoration trajectory. The key recommendations for adaptive measures to improve the restoration trajectory included:

1. Continued vegetation monitoring including physical planting of wetland vegetation in project plans to accelerate establishment of desired wetland plant species and overall salt marsh ecosystem.
2. Stabilization of bank erosion at Freemans Pond and extension of the culvert wing walls.
3. Long-term management may involve thin-layer deposition to support and maintain salt marsh vegetation.
4. For future projects, APCC stresses the importance of setting clearly defined goals with measurable outcomes.

Conservation District concluded that restoring tidal flow to a degraded marsh is achieving the desired Project objectives.

Update adaptive management costs are based on the Plan/EIS criteria. Adaptive management costs for shellfish area and salt marsh monitoring are estimated at 11.2% of construction costs. Adaptive management costs for shellfish area stormwater and salt marsh construction are estimated at 2% of construction costs. No additional costs for engineering, project management, permits included since these would be relatively insignificant based on a percentage of the adaptive management construction costs. The estimated costs are shown in Appendix H.

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* Contact NRCS for additional information regarding these sections.

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Appendix A Status of Original 76 Stormwater Priority Sites

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July 2021 Status of the Original Plan/EIS Priority Stormwater Restoration projects								
Site no.	Town	Location	Habitat units	Installed with ARRA Funds	Installed by Others	Remains Priority to Address	Town no longer interested	Comments/Notes
BA-SW-1	Barnstable	Cotuit Town Pier at Oyster Place Road	536		yes			
BA-SW-2	Barnstable	Cotuit Old Shore Rd from Main St. to Boat Landing	536		yes	yes		Additional work needed after SNEP Grant project.
BA-SW-9	Barnstable	East Bay Boat Ramp	157		yes	yes		
BA-SW-13	Barnstable	Bay Shore Rd	46		yes			
BA-SW-18	Barnstable	Scudder Lane Boat Ramp	2092/100	yes	yes			Adjustment made to habitat unit benefited area. Originally 2092 corrected to 100 based on updated method to determine affected shellfish area.
BO-SW-4	Bourne	Cohasset Narrows	221		yes			
BO-SW-7	Bourne	Queen Sewell Cove	98			yes		Still needed
DE-SW-4	Dennis	Fisherman's Landing	298		yes	yes		Still needed, Additional work needed
DE-SW-5	Dennis	Leif Ericson	298		yes			
DE-SW-11	Dennis	Wrinkle Point	204		yes			
EA-SW-1	Eastham	Salt Pond	22			yes		Site was part of CCWRRP phase 2 but land rights issues caused cancellation.
EA-SW-4	Eastham	Fort Hill	416					Still needed
FA-SW-2	Falmouth	Curley Blvd	17		yes			
HAR-SW-1	Harwich	Hulse Pt	19			yes		Still needed
HAR-SW-2	Harwich	Lower County Rd.	19			yes		Still needed
MA-SW-2	Mashpee	Shoestring Bay	102	yes				Still needed, Additional work needed
ORL-SW-3	Orleans	High Tide Ln. Marina	314		yes			
PR-SW-1	Provincetown	Provincetown Inn	131		yes			
WE-SW-5	Wellfleet	Holbrook Ave	247	yes				
WE-SW-6	Wellfleet	Commercial St.1	247	yes				
YA-SW-5	Yarmouth	Mill Creek @ 28	26			yes		Still needed
YA-SW-7	Yarmouth	Mill Creek @ Bogs	26					Still needed
YA-SW-32	Yarmouth	Susan Rd.	298		yes			
YA-SW-33	Yarmouth	Aunt Dorahs	298		yes			
YA-SW-35	Yarmouth	Longview	298		yes			
YA-SW-45	Yarmouth	Merchant Ave 2	298			yes		Still needed
		Total Habitat Unit Goal*	7264					

* Updated method to determine affected shellfish area applied to remaining sites to reach original goal. Updated method applies ratio of an individual site's drainage area the total drainage area of all stormwater discharge sites multiplied by the total shell fish growing area.

Appendix B Status of Original 76 Fish Passage Priority Sites

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July 2021 Status of the Original Plan/EIS Priority Fish Passage Obstruction Restoration Projects								
NRCS site number	Town	Waterbody	Habitat units	Installed with ARRA Funds	Installed by Others	Remains Priority to Address	Sponsor no longer interested	Comments/Notes
BA-FP-LE-1	Barnstable	Red Lilly Pond	10			yes		Sponsor remains interested but Not a DMF priority
BA-FP-MMR-2	Barnstable	Marston Mills R. Mill Pond Dam	6			yes		Town plans to re-build as part of MM Village Plan
BA-FP-MMR-5	Barnstable	Marston Mills R Middle Pond Control-Fish Ladder	250			yes		Priority Project-CCWRRP Phase 2 Agreement in place for construction/in design phase
BA-FP-SanR-1 and	Barnstable	Santuit River	166					Remedial Work.
MA-FP-SR-2	Mashpee			yes				Culvert under Sampsons Mill Rd. replaced_CCWRRP Phase 2
BA-FP-WL-1	Barnstable	Wequaquet Lake	702			yes		Water Level Control and Fish Structure needed at Long Pond outlet which affect Lake Wequaquet FP
BO-FP-MR-2 and BO-FP-MR-3	Bourne	Monument River	501			yes		New Motel owner. DMF Priority. Still in initial planning phase
BO-FP-RB-1 and BO-FP-RB-2	Bourne	Red Brook	17			yes	x	Design Completed uinder ARRA. Still needed. Low town interest
BR-FP-SB-3	Brewster	Stoney Brook	386		yes	yes		Improvements have been made to Rte 6A culvert and parts of fishway u/s of mill. CCWRRP Phase 3 initiating design for retaining wall u/s of mill as well as evaluating the entire fishway.

July 2021 Status of the Original Plan/EIS Priority Fish Passage Obstruction Restoration Projects								
NRCS site number	Town	Waterbody	Habitat units	Installed with ARRA Funds	Installed by Others	Remains Priority to Address	Sponsor no longer interested	Comments/Notes
CH-FP-LL-1 and CH-FP-LL-1A and CH-FP-LL-2	Chatham	Lovers Lake	16			yes		MA-DOT initiating H&H Modeling and culvert design.
CH-FP-LL-4	Chatham	Lovers Lake	36			yes		Project is part of CCWRRP phase 3
DE-FP-SC-1	Dennis	Sesuit Creek	53			yes		Mass DOT currently designing replacement of two Rte 6A culverts. This was listed as PP for CCWRRP phase 3, however MADOT funding design and installation.
EA-FP-HR-1	Eastham	Herring River	42			yes		Multiple sites along the river are listed for replacement by CCWRRP
FA-FP-ChR-2	Falmouth	Childs River	317				x	Outlet screen at Johns Pond needed. DMF has redirected flow for proper function
FA-FP-CL-1	Falmouth	Cedar Lake Ditch	21	yes				
HA-FP-HR-3	Harwich	Herring River	1,119			yes		Includes West Reservoir, Seymour Pond, Hinckleys Pond and Long Pond

July 2021 Status of the Original Plan/EIS Priority Fish Passage Obstruction Restoration Projects								
NRCS site number	Town	Waterbody	Habitat units	Installed with ARRA Funds	Installed by Others	Remains Priority to Address	Sponsor no longer interested	Comments/Notes
MA-FP-QR-7	Mashpee	Quashnet River (Johns Pond)	317			yes		CCWRRP Phase 3-currently in H&H Study and fish ladder review/design to deal with shaoling and erosio ar ladder
OR-FP-PL-1	Orleans	Pilgrim Lake	39		yes	yes		MA-DMF rebuilt structure at Pilgrim Lake in 2019. WHIP rplaced inlet culvert. Interior of run needs rebuilding.
WE-FP-HR-1	Wellfleet	Herring River	157			yes		Project undergoing extensive study and design
YA-FP-WB-1	Yarmouth	Whites Brook	36		yes	yes		MADMF has made improvements but needs replacement. DMF and Gun Club perform annual O&M

Appendix C Status of Original 76 Salt Marsh Priority Sites

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July 2021 Status of the Original Plan/EIS Priority Salt Marsh Restoration Projects								
Site No.	Town	-	Habitat units	Installed with ARRA Funds	Installed by Others	Remains Priority to Address	Town no longer interested	Comments/Notes
BA-SM-6	Barnstable	Maraspin Creek at Commerce Road	5			yes		ARRA did Feasibility Study 10/2012. Town has recently expressed interest.
BA-SM-12	Barnstable	Unnamed channel off Bumps River at Bay Lane	10				x	
BA-SM-18	Barnstable	Unnamed Creek at Hawes Avenue	12				x	
BA-SM-19	Barnstable	Snows Creek at Ocean Street	20			yes		Town has secured design, however very small tidal restoration benefit.
BN-SM-6	Bourne	Mashnee Rd. culvert	5				x	
BN-SM-16	Bourne	Kenwood Rd. culvert	4				x	
BN-SM-28	Bourne	Railroad dike culvert near Pocasset River	1				x	
BN-SM-32	Bourne	Bridge off Benedict Road	8				x	
BN-SM-38	Bourne	Service Road culvert on Canal	8				x	
BN-SM-39	Bourne	Earthen bog dike culvert on Buttermilk Bay	4				x	
BN-SM-43	Bourne	Earthen dike culvert off Mashnee Road	10				x	
BR-SM-6	Brewster	Brewster Unnamed channel off Stony Brook at Route 6A	32		yes			
CH-SM-4	Chatham	Unnamed channel off Bucks Creek at Cranberry Lane	6				x	
DE-SM-5	Dennis	Weir Creek at Lower County Road	42			yes		Project included in CCWRRP Phase 3 for feasibility and design
EA-SM-1	Eastham	Rock Harbor Creek at Dyer Prence Road	12		yes			

July 2021 Status of the Original Plan/EIS Priority Salt Marsh Restoration Projects								
Site No.	Town	-	Habitat units	Installed with ARRA Funds	Installed by Others	Remains Priority to Address	Town no longer interested	Comments/Notes
HA-SM-4	Harwich	Tributary to the Herring River at Lothrop Road	14			yes		
HA-SM-9/ CH-SM-7	Harwich/ Chatham	Muddy Creek at Route 28	18		yes			ARRA did Feasibility Study-DER and Towns installed
SA-SM-9	Sandwich	Long Creek/Cow River at Ploughed Neck Road	80				x	ARRA did Feasibility Study
TR-SM-4	Truro	Pamet River at Route 6	152			yes		CCWRRP phase 3 has project listed for Feasibility and Design
WE-SM-3	Wellfleet	Blackfish Creek at Route 6	17				x	
WE-SM-4	Wellfleet	Indian Neck marsh channel at earthen dike	7				x	
WE-SM-5	Wellfleet	Mayo Creek at Commercial Street	19			yes		Still needed but issues with domestic wells
WE-SM-6	Wellfleet	Herring River at Chequessett Neck Road	1,000			yes		ARRA funded various studies associated with overall project. CCWRRP Phase 3 has project listed for additional studies
YA-SM-2	Yarmouth	Hallets Mill Pond at Mill Lane	6			yes		
YA-SM-3	Yarmouth	Short Wharf Creek at Thacher Shore Road	4			yes		ARRA did Feasibility Study. Still needed
YA-SM-5	Yarmouth	Unnamed channel into salt pond at Bayview Street	1				x	

Appendix D NEPA Supplementation Review and Documentation Checklist

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United States Department of Agriculture

Natural Resources Conservation Service
Massachusetts State Office, 451 West Street, Amherst, MA 01002
413-253-4350 | fax 855-596-7666 | www.ma.nrcs.usda.gov

April 9, 2021

MEMO TO THE ADMINISTRATIVE FILE

NEPA SUPPLEMENTATION REVIEW AND DOCUMENTATION CHECKLIST

for the

AREAWIDE ENVIRONMENTAL EVALUATION

under the

CAPE COD WATER RESOURCES RESTORATION PROJECT

BARNSTABLE COUNTY, MASSACHUSETS

Sponsored by the

CAPE COD CONSERVATION DISTRICT

To ensure that the proposed actions under the Cape Cod Water Resources Restoration Project (CCWRRP) and Areawide Environmental Impact Statement (EIS) is still valid, the following documents whether circumstances and environmental conditions have changed to the extent that a supplemental EIS should be prepared for the proposed action.

A review of USDA-Natural Resources Conservation Service (NRCS) National Watershed Program Manual (NWPM), Part 503, and the National Watershed Program Handbook (NWPH), Part 603) have determined that neither a revised watershed project plan or a supplemental watershed plan is required to be prepared. No new problems that require Federal assistance have been identified nor are there numerous complex changes in the planned measures. There are no changes in project purposes, scope, major features or Sponsor responsibilities. Therefore there are no modifications or changes to the proposed actions that have a bearing on environmental effects require that a supplemental Plan-EIS be prepared.

Additionally, the National Environmental Policy Act (NEPA) requires that supplements to existing EIS be prepared if substantial changes in the proposed action that are relevant to environmental concerns, or there are significant new circumstances or information relevant to environmental concerns that have bearing on the proposed action or its impacts.

NRCS Part 610 of the National Environmental Compliance Handbook provides a checklist (Part 610.134 NEPA Supplementation Review and Documentation Checklist) to determine if a supplemental EIS is needed. The following completed checklist documents that a supplemental EIS is not needed:

New Information/Change in Existing Conditions and Need for Supplementation

1) Have substantial changes in the proposed action been made that were not fully considered in the initial environmental analysis?

No. The proposed actions remain the same to meet the three CCWRRP Plan/EIS objectives (1) restore degraded salt marshes, (2) restore anadromous fish passages, and (3) improve water quality for shellfishing areas.

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2) Have project conditions or information changed such that the proposed action may have increased the potential for significant adverse effects on public health or safety?

No. The remaining proposed work will not have a negative impact on health or safety.

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3) Have project conditions or information on the proposed project changed such that the proposed action may have increased significant adverse effects on such natural resources and unique geographic characteristics as historic or cultural resources; park, recreation, or refuge lands; wilderness areas; wild or scenic rivers; national natural landmarks; sole or principal drinking water aquifers; prime farmlands; wetlands (Executive Order 11990); floodplains (Executive Order 11988); national monuments; migratory birds (Executive Order 13186); and other ecologically significant or critical areas under Federal ownership or jurisdiction?

No increases of significant adverse effects for the remaining proposed work are anticipated. Furthermore, each specific site requires documentation on Form NRCS-CPA-52, "Environmental Evaluation Worksheet" to determine if that particular site needs an Environmental Evaluation or an Environmental Assessment or its individual Environmental Impact Statement.

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4) Have project conditions or information on the proposed project changed such that the proposed action may have increased the potential for highly controversial environmental effects or involve unresolved conflicts concerning alternative uses of available resources (NEPA Section 102(2)(E))?

No. An increase of highly controversial environmental effects is not anticipated. The remaining proposed measures will result in positive environmental benefits for Cape Cod. Furthermore, each specific site requires documentation on Form NRCS-CPA-52, "Environmental Evaluation Worksheet" to determine if that particular site needs an Environmental Evaluation or an Environmental Assessment or its individual Environmental Impact Statement.

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5) Have project conditions or information on the proposed project changed such that the proposed action may have increased the potential for highly uncertain and

potentially significant environmental effects or involve unique or unknown environmental risks? Example: Dam classification and engineering has changed to require the dam to be classified as a high-hazard dam.

No increases of highly uncertain and potentially significant environmental effects or unique or unknown environmental risks for the planned or proposed work are anticipated Furthermore, each specific site requires documentation on Form NRCS-CPA-52, "Environmental Evaluation Worksheet" to determine if that particular site needs an Environmental Evaluation or an Environmental Assessment or its individual Environmental Impact Statement.

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6) Have project conditions or information on the proposed project changed such that the proposed action may have increased the potential for setting a precedent for future action or represent a decision in principle about future actions with potentially significant environmental effects?

No increases in the potential for setting a precedent for future action or represent a decision in principle about future actions with potentially significant environmental effects for the planned or proposed measures are anticipated. Furthermore, each specific site requires documentation on Form NRCS-CPA-52, "Environmental Evaluation Worksheet" to determine if that particular site needs an Environmental Evaluation or an Environmental Assessment or its individual Environmental Impact Statement.

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7) Have project conditions or information on the proposed project changed such that the proposed action may have increased the potential to result in actions with individually insignificant but cumulatively significant environmental effects?

No increases in the potential to result in actions with individually insignificant but cumulatively significant environmental effects for the planned or proposed work are anticipated. Furthermore, each specific site requires documentation on Form NRCS-CPA-52, "Environmental Evaluation Worksheet" to determine if that particular site needs an Environmental Evaluation or an Environmental Assessment or its individual Environmental Impact Statement.

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8) Have project conditions or information on the proposed project changed such that there is an increased potential for effects on historic properties listed in or eligible for listing in the National Register of Historic Places as determined by the NRCS State office after consultation with the State historic preservation officer, appropriate federally recognized American Indian Tribes, appropriate Tribal historic preservation officers, or other appropriate consulting parties that the State office identifies, in accordance with the National Historic Preservation Act Section 106 as implemented by 36 CFR Part 800?

No increases in the potential for effects on historic properties listed in or eligible for listing in the National Register of Historic Places for the planned or proposed additional work are anticipated. Furthermore, each specific site requires documentation on Form

NRCS-CPA-52, “Environmental Evaluation Worksheet” to determine if that particular site needs an Environmental Evaluation or an Environmental Assessment or its individual Environmental Impact Statement.

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9) Have project conditions or information on the proposed project changed such that there is an increased potential for effects to species listed, or proposed to be listed, on the List of Endangered or Threatened Species under the Endangered Species Act, or have the potential for effects on designated critical habitat for these species?

No. Although there have been changes to the Federal and State T&E species listings, each specific project site undergoes a required Form NRCS-CPA-52, “Environmental Evaluation Worksheet” to determine if that particular site needs an Environmental Evaluation or an Environmental Assessment or its individual Environmental Impact Statement.

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10) Have project conditions or information on the proposed project changed such that the proposed action may have increased the potential for violating a Federal, State, local, or Tribal law, or requirement imposed for the protection of the environment?

No increases in the potential for violating a Federal law, or a State, local, or Tribal law or requirement imposed for the protection of the environment for the planned or proposed work are anticipated.

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11) Have project conditions or information on the proposed project changed such that the proposed action may have increased the potential for disproportionately high and adverse effect on lowincome or minority populations (Executive Order 12898)?

No increases in the potential for disproportionately high and adverse effect on low income or minority populations for the planned or proposed work are anticipated.

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12) Have project conditions or information on the proposed project changed such that the proposed action may have increased the potential to contribute to the introduction, continued existence, or spread of noxious weeds or nonnative invasive species known to occur in the area or actions that may promote the introduction, growth, or expansion of the range of such species (Federal Noxious Weed Control Act and Executive Order 13112)?

No increases in the potential to contribute to the introduction, continued existence, or spread of noxious weeds or nonnative invasive species known to occur in the area or actions that may promote the introduction, growth, or expansion of the range of such species for the planned or proposed work are anticipated.

Based on the responses provided above, I find that:

Substantial changes in the proposed action **HAVE NOT** been made or the potential effects and information on the proposed action **HAVE NOT** significantly changed such that a supplemental EIS needs to be prepared, and there is no new information having a bearing on environmental effects or environmental conditions to the degree that necessitates the preparation of a supplemental EIS.

Justification for the determination: There have been no changes made in the CCWRRP Plan / EIS or its potential effects which will not be addressed in the site specific documentation on Form NRCS-CPA-52, "Environmental Evaluation Worksheet" to determine if that particular site needs an Environmental Evaluation or an Environmental Assessment or its individual Environmental Impact Statement.

Dan L. Wright

STATE CONSERVATIONIST

Responsible Federal Official

Appendix E Updated Priority Stormwater Sites 2021

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Appendix E Updated Priority Stormwater Sites 2021				
Town	Site ID	Site Name	EOPCC	Countable Total Habitat Units
Barnstable	BA-SW-2	Cotuit Old Shore Rd.	$270,000	454
Barnstable	BA-SW-22	South Main st. Centerville (Bumps River bridge).	$1,180,000	28
Barnstable	BA-SW-9	East Bay ramp.	$400,000	84
Barnstable	BA-SW-A	Sea View Ave	$410,000	105
Barnstable	BA-SW-B	Clamshell Cove RD.	$90,000	30
Barnstable	BA-SW-C	BA-SW-C Clamshell Cove rd South.	$470,000	30
Bourne	BO-SW-1A	Hen Cove.	$660,000	48
Bourne	BO-SW-1B	Site SW-1B is Circuit Ave	$980,000	150
Bourne	BO-SW-1C	Saco	$1,090,000	110
Bourne	BO-SW-2	Monks Park/Valley Bars .	$310,000	18
Bourne	BO-SW-5	Old Head of the Bay Rd at Little Buttermilk Bay	$770,000	115
Chatham	CH-SW-12	Fox Hill Rd. @ Crows Pond	$570,000	92
Chatham	CH-SW-13	13 Sears Rd. @ Oyster Pond River.	$130,000	19
Chatham	CH-SW-3	Eliphamets Lane.	$410,000	19
Chatham	CH-SW-B	Little MIll Pond @ Homestead Lane.	$450,000	31
Dennis	DE-SW-1	Sesuit Harbor .	$2,220,000	189
Dennis	DE-SW-3	Follins Pond Landing from Mayfair drains into Pond.	$1,420,000	61
Dennis	DE-SW-4	Old Fishhouse Rd.	$540,000	132
Dennis	DE-SW-6	Cove Rd. Landing	$430,000	148
Eastham	EA-SW-10	Collins Landing @ Town Cove.	$160,000	24

Appendix E Updated Priority Stormwater Sites 2021				
Town	Site ID	Site Name	EOPCC	Countable Total Habitat Units
Eastham	EA-SW-2	Salt Pond landing area (Town prope rty below rt 6) .	$130,000	50
Eastham	EA-SW-5	Thumpertown area @ Seaview Ave.	$560,000	166
Eastham	EA-SW-8	Hemenway Rd and ramp.	$500,000	155
Falmouth	FA-SW-A	Waquoit Landing.	$320,000	80
Falmouth	FA-SW-D	Captains Lane@ Green Pond.	$910,000	0
Falmouth	FA-SW-F	Old Dock Rd.@ W. Falmouth Harbor.	$680,000	54
Falmouth	FA-SW-G	Series of outfalls along Edgewater Dr.	$5,580,000	81
Mashpee	MA-SW-2	Town priority: Ramp@ Mashpee Neck Rd. Adaptive Mgt	$150,000	396
Orleans	OR-SW-C	Rock Harbor.	$710,000	6
Orleans	OR-SW-D	Herring Brook Way.	$200,000	18
Orleans	OR-SW-E	Namequoit Rd.	$220,000	10
Orleans	OR-SW-1	Rock Harbor	$710,000	54
Provincetown	PR-SW-10	Pearl St	$1,180,000	45
Provincetown	PR-SW-2	Point ST	$4,780,000	45
Provincetown	PR-SW-5	Coast Guard outfall; (Tremont, School, Franklin and Wharf st)	$7,880,000	45
Provincetown	PR-SW-A	Ryder outfall	$1,180,000	45
Provincetown	PR-SW-B	Gosnold outfall	$9,230,000	45
Provincetown	PR-SW-C	Commercial St West End; (rotary to West end parking lot);Porous Pavement	$26,340,000	45

Appendix E Updated Priority Stormwater Sites 2021				
Town	Site ID	Site Name	EOPCC	Countable Total Habitat Units
Sandwich	SA-SW-4	These two residential areas (SW-4 and SW-5) both drain into Scorton Creek north of Rt 6A.	$340,000	52
Sandwich	SA-SW-5	Goose Point (LInden La) (4+5)	$840,000	52
Truro	TR-SW-3	Pamet Parking Lot (boat ramp and parking area)	$1,260,000	62
Wellfleet	WE-SW-10	Paine Hollow Rd Landing	$310,000	77
Wellfleet	WE-SW-11	Pleasant Point RD Landing	$220,000	77
Wellfleet	WE-SW-3	Powers landing.	$240,000	15
Wellfleet	WE-SW-4	Kendrick Ave.	$430,000	165
Wellfleet	WE-SW-A	7 outfalls A-G along Lieutenant Island Rd.	$240,000	14
Wellfleet	WE-SW-B	7 outfalls A-G along Lieutenant Island Rd.	$430,000	14
Wellfleet	WE-SW-C	8 outfalls A-G along Lieutenant Island Rd.	$430,000	14
Wellfleet	WE-SW-D	9 outfalls A-G along Lieutenant Island Rd.	$430,000	14
Wellfleet	WE-SW-E	7 outfalls A-G along Lieutenant Island Rd.	$430,000	14
Wellfleet	WE-SW-F	7 outfalls A-G along Lieutenant Island Rd.	$430,000	14
Wellfleet	WE-SW-G	7 outfalls A-G along Lieutenant Island Rd.	$430,000	14
Yarmouth	YA-SW-10/11	Colonial Acres/Windemere	$430,000	242
		Total	$81,110,000	4067

* Updated method to determine affected shellfish area applied to remaining sites to reach original goal. Updated method applies ratio of an individual site's drainage area the total drainage area of all stormwater discharge sites multiplied by the total shell fish growing area.

Appendix F Updated Priority Fish Passage Sites 2021

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Appendix F Updated Priority Fish Passage Sites December 2021					
Town	Site ID	Site Name	Location	EOPCC	Habitat Units
Barnstable	BA-FP-UP-1	Long Pond	Holley Lane	$585,000	654
Barnstable	BA-FP-UP-2	Upper Marston Mills /	Middle Pond	$1,820,000	133
Barnstable	BA-FP-UP-3	Rosa Lane	Rosa Lane	$611,000	133
Barnstable	BA-FP-UP-4	Mill Pond Dam	Rt 149 & Rt 28	$3,989,000	134
Barnstable	BA-FP-UP-5	Lovell's Pond	Santuit / Newtown Rd.	$1,246,000	18
Barnstable	BA-FP-UP-6	Putnam Avenure	Putnam Avenure	$1,804,000	18
Barnstable	BA-FP-UP-7	Old Post Road	Old Post Road	$1,804,000	18
Barnstable	BA-FP-UP-8	Lake Elizabeth	Lake Elizabeth outlet channel	$585,000	10
Bourne	BO-FP-UP-1	Red Brook	Fish ladder above RR	$1,246,000	8
Bourne	BO-FP-UP-2	Red Brook	Harbor - RR culvert outlet	$1,424,000	8
Brewster	BR-FP-UP-1	Stony Brook South *	Stony Brook South	$1,068,000	193
Brewster	BR-FP-UP-2	Stony Brook North *	Stony Brook North	$1,221,000	193
Chatham	CH-FP-UP-1	Rt 28 Culvert - Ryders	Rt 28	$1,016,000	55
Falmouth	FA-FP-UP-1	Martin Road	Martin Road	$1,016,000	317
Harwich	HA-FP-UP-1	Grassy Pond	Bank Street culvert & Grassy Pond.	$2,516,000	24
Harwich	HA-FP-UP-2	Rte 124/Bke Path	Rte 124	$2,999,000	279
Harwich	HA-FP-UP-3	Punkhorn Road	Punkhorn Road	$788,000	279
Harwich	HA-FP-UP-4	Bike Path	Depot Street	$1,068,000	279
Harwich	HA-FP-UP-5	West Reservoir	Depot St.	$1,957,000	280
Mashpee	MA-FP-UP-1	Johns Pond *	Johns Pond	$603,000	317
Mashpee	MA-FP-UP-2	Mashpee Pond	Pond Outlet	$508,000	245
Mashpee	MA-FP-UP-3	Sluice/Channel	Collin's Lane	$508,000	245
Mashpee	MA-FP-UP-4	Mashpee Wampanoag Indian Msm	Rt 130	$713,000	246
Orleans	OR-FP-UP-1	Pilgrim Lake Fishladder	Herring Brook Way	$2,703,000	319
Wellfleet	WE-FP-UP-1	Herring Pond Higgins Pond Schoolhouse Road	Schoolhouse Hill Rd	$267,000	78
Wellfleet	WE-FP-UP-2	Herring Pond Old Kings Highway	Old Kings Highway	$285,000	79
Yarmouth	YA-FP-UP-1	Long Pond Outlet	Long Pond Outlet	$459,000	28
Yarmouth	YA-FP-UP-2	Forest Road	Forest Road	$611,000	29
Yarmouth	YA-FP-UP-3	Whites Brook	Rod & Gun Club	$508,000	35
			Total	$35,930,000	4654

Appendix G Updated Priority Salt Marsh Sites 2021

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Appendix G Updated Priority Salt Marsh Sites 2021				
Town	Site ID	Name	EOPCC	Habitat Units
Brewster	BR-SM-4	Paine's Creek Road restriction of channel into Freemans Pond	$632,000	Adaptive Management for 2011 CCWRRP installation
Chatham	CH-SM-6, CH-SW-9, CH-6, DMF, CH-FP-FFC-1(new*)	Route 28 and earthen dike restriction of Frost Fish Creek	$2,605,000	35
Dennis	DE-SM-5 and DE-SM-6	Lower County Road restriction of Weir Creek	$3,039,000	45.7
Eastham	EA-SM-6 and 7	Governor Prence Road Culvert and Stone Dike d/s on Abelino's Creek	$1,574,000	30
Falmouth	FA-SM-17	Oyster Pond, West Falmouth Harbor	$1,276,000	4.5
Harwich	HA-SM-4	Tributary to the Herring River at Lothrop Road	$2,165,000	14
Harwich	HA-SM-H	Saquatucket Harbor Marina / Cold Brook Route 28 and Hoyt Road	$4,459,000	10
Orleans	OR-SM-7	Cranberry Bog Berm Restriction of Creek off The Narrows	$204,000	3.7
Sandwich	SA-SM-12	Jones Lane Restriction of Scorton Creek (Sandwich)	$2,036,000	34
Truro	TR-SM-3	Restrictions of the Pamet River by Truro Center Road/Route 6A.	$5,561,000	57
Truro	Corn Hill Road	Little Pamet River Corn Hill Road Salt Marsh Restoration	$8,063,000	45
Truro	TR-SM-A	Little Pamet River - Castle Road	$1,597,000	20
Truro	TR-SM-2	Mill Pond Road Restriction of Mill Pond	$2,011,000	13
Truro	TR-SM-4	Restrictions of the Pamet River by Route 6.	$25,818,000	95
Truro	TR-SM-6/7	Pilgrim Lake/East Harbor	$23,170,000	325
Wellfleet	WE-SM-6	Herring River	$70,747,000	890
Wellfleet	WE-SM-5	Commercial Street Restriction of Mayo Creek	$4,048,000	22
Yarmouth	YA-SM-Crab_Creek	Crab Creek	$2,451,000	70
		TOTAL	$161,454,000	1714

Appendix H Updated Project Costs *

* Contact NRCS for additional information regarding this section.

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Appendix I Priority Project Funds by Town *

* Contact NRCS for additional information regarding this section.

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Appendix J Updated Shellfish Site Ranking Criteria 2021

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Appendix J
Updated Shellfish Site Ranking Criteria 2021
Quality of shellfish habitat (Ma DMF suitability maps) More than 2 species = 5 pts 2 species = 3 pts 1 species = 1 pts None = 0 pts
Other land/water use pollution sources (known septic, mooring areas, excessive seaweed wrack) None or sewered = 5 pts Moderate number of sources = 3 pts Many other sources = 1 pts
Partner level support Designs complete/$ match available DMF priority = 5 pts General town support = 3 pts Known opposition = 1 pts
Land Rights Town owned or easements secured = 3 pts Single private ownership = 2 pts Multiple private ownership =1 pts
Additional benefits from project installation (Saltmarsh water quality, sediment reduction, beaches) More than one benefit = 2 pts One other benefit = 1 pts None = 0 pts
Wildlife impacts on land/water (waterfowl/ mammalian concentrations) None = 5 pts Occasional = 3 pts Resident populations/frequent = 0 pts
Distance to shellfish recreational or commercial use area 0 to 300 ft = 5 pts 301 to 1000 ft = 3 pts 1001 to 2500 ft = 1 pts more than 2500 ft = 0 pts
Distance to aquaculture activity (licensed areas, relay, depuration, winter storage, upwellers) 0 to 300 ft = 5 pts 301 to 1000 ft = 3 pts 1001 to 2500 ft = 1 pts Greater than 2500 ft = 0 pts
Distance to aquaculture activity (licensed areas, relay, depuration, winter storage, upwellers) 0 to 300 ft = 5 pts 301 to 1000 ft = 3 pts 1001 to 2500 ft = 1 pts More than 2500 ft = 0 pts
Habitat Units (acres) of shellfish habitat impacted by stormwater outfalls (Formula to quantify acres based on Classification area as % of treated outfalls in watershed) Greater than 100 acres = 12 pts 100 to 51 acres = 9 pts 50 to 21 acres = 6 pts 20 to 6 acres = 3 pts 5 or less = 1 pts

Appendix K Updated Salt Marsh Site Ranking Criteria 2021

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Appendix K - Salt Marsh Secondary Ranking Criteria					
Criteria	**Description**	**Ranking**	**Max Score**	**Min Score**	**Source of Information for Ranking**
Holistic Nature of Project	Projects that take a more holistic approach to addressing habitat restoration and water quality improvements are ranked higher for their ecological value. This criteria is ranked based on classification of projects as one or more project types: salt marsh, fish run, stormwater, coastal resilience, pond, stream, freshwater wetland, and others as defined. This is to be used as a proxy to the number of resources addressed by a given project.	Rank based on actual number of project types addressed within each individual project. If a project is just a stormwater project, score = 1. If project includes stormwater + fish run + pond, score = 3. Project type options include: salt marsh, fish run, stormwater, coastal resilience, pond, stream, and freshwater wetland.	7	1	Inventory - Project Type.
Water Quality Based on TMDL Categories	For projects seeking to restore impaired waters we would rank those according to level of impairment with more degraded projects receiving a higher ranking for ecological restoration value. This would be completed based on the 2014 Massachusetts Integrated List of Waters (303d and TMDL ratings).	Use TMDL categories as scores: Category 5 (Impaired or threatened for one or ore uses and requiring a TMDL) = 5 Category 4 (Impaired or threatened for one or more uses, but not requiring TMDL) = 4 Category 3 or no listing (Insufficient information to make assessment) = 3 Category 2 (Unimpaired for some uses and not assessed for others) =2 Category 1 (Unimpaired and not threatened for all designated uses) = 1 For project sites that have more than one potential TMDL category score with the higher option. For water bodies that are not rated or which enter into water bodies that are not rated, ie. Nantucket Sound, give an intermediate score of 3.	5	1	Inventory - TMDL category.
Water Quality Based on Shellfish Growing Area Designations	Projects that would improve the water quality of designated shellfish growing areas receive a higher ranking as they provide not only ecological value but also economic value to the community.	Score as follows: Prohibited = 5 Restricted = 4 Conditionally Restricted = 3 Conditionally Approved = 2 Approved = 1 If project is not directly linked to shellfish growing area (freshwater) give intermediate score of 3. For sites with more than one potential rating give the higher (more degraded) rating.	5	1	GIS Map layer: 1. Designated Shellfish Growing

Appendix K - Salt Marsh Secondary Ranking Criteria					
Criteria	**Description**	**Ranking**	**Max Score**	**Min Score**	**Source of Information for Ranking**
Area restored	Projects with greater area are ranked higher for their ecological footprint. Area determinations are specific to the type of project (stormwater, fish passage, salt For projects lacking area data give moderate ranking (medium = 3). This will	Score Salt Marsh areas as follows: Large, Greater than 35 acres = 5; Medium/Large, 25-35 acres = 4; Medium, 15-25 acres = 3; Small/Medium, 5-15 acres = 2; Small, Less than 5 acres = 1.	5	1	Inventory - Size. Area information
		Fish Run: total impoundment acreage of fish run associated with project. (Breakdown of acres is based on CCWRRP fish run acreage scoring). Greater than 100 acres = 5; 51-100 acres = 4; 21-50 acres = 3; 6-20 acres = 2; Small, 1-5 acres = 1	5	1	Inventory - Impoundment acreage from DMF survey of anadromous fish runs. For smaller runs
		Coastal resilience project: acres or length of shoreline protected or area of dune restoration. Large = 5; Medium = 3; Small = 1	5	1	
		Stormwater: measure of drainage area according to mapped impervious surface. Large, to be defined = 5; Medium, to be defined = 3; Small, to be defined = 1	5	1	

Appendix K - Salt Marsh Secondary Ranking Criteria					
Criteria	**Description**	**Ranking**	**Max Score**	**Min Score**	**Source of Information for Ranking**
Support sensitive resources	Projects located in areas with more sensitive resources are ranked higher for their ecological value. Determined using GIS map layers overlaid with the RCC Project Map showing proximity of rare species/habitats, etc. relative to inventory projects.	Use actual number of resources supported by project (i.e. directly overlapping project area or bordering on water body impacted by project). Project area is defined as the total land and water area likely to be affected by the restoration. "Bordering" means directly contacting any portion of the project area. In the case of an open water body points are scored for all sensitive resources that exist within or along the shores of that water body. Projects along the shores of a bay were given points for cold water fisheries and anadromous fish when fish would have to pass through the bay on the way to a stream or fish run.	6	0	GIS Map Layers: 1. Biomap 2 (MassGIS) 2. NHESP Priority Habitats (MassGIS) 3. Shellfish Suitability Areas (MassGIS) 4. Eelgrass (MassGIS) 5. Coldwater Fisheries Resources 6. Anadromous Fish (MassGIS)
Human use benefits	Projects that help obtain human uses (swimming, boating, fishing), support an environmental justice area or provide other human use benefits receive a higher ranking.	Use actual number of human use benefits supported by project (i.e. directly overlapping project area or directly bordering on water body/embayment/estuary likely to be impacted by the project). Project area is defined as the total land and water area likely to be affected by the restoration. "Bordering" means directly contacting any portion of the project area. In the case of an open water body points are scored for all sensitive resources that exist within or along the shores of that water body. The three layers, Marine Beaches, Boating & Fishing Access, and Freshwater Beaches are not comprehensive across all of the Cape and thus visual assessment using a satellite basemap was used to accurately score this criteria. In addition features explictly identified in GIS layers any shorelines that appear to have sandy beaches with obvious public or private access (parking lot, walkway, bikepath, etc.) are given a point. Additional boating and fishing points are also given based on the visual presence of boat landings, docks, mooring fields, or boats when viewing the site.	4	0	GIS Map Layers: 1. Marine Beaches (MA GIS). 2. Environmental Justice "EJ2010" (MA GIS) 3. MA Office of Boating and Fishing Access Sites. 4. DEP Approved Wellhead

Appendix K - Salt Marsh Secondary Ranking Criteria					
Criteria	**Description**	**Ranking**	**Max Score**	**Min Score**	**Source of Information for Ranking**
Habitat Connectivity and Linkage to Other Protected Areas	Projects that are linked to existing protected areas (conservation land, town land, other waterbodies etc.) or which remove barriers to connectivity are ranked higher.	Improvement to both aquatic habitat connectivity **and** linkage to open space = 5. Improvement to aquatic habitat connectivity **or** linkage to open space = 3. No improvement to aquatic habitat connectivity or linkage to open space = 1. All tidal restoration and fish run projects are considered improvements to aquatic habitat connectivity. Other project types should be considered on an individual basis as to whether they improve aquatic habitat connectivity. For open space determination, only include Open Space protected in perpetuity (dark green on mapped parcels) for ranking. Open space areas that are overlapping or share a direct border with affected project areas are counted.	5	1	Map Layers: 1. Open Space Level of Protection (Cape Cod
Resilience to Sea Level Rise	Elevation and migration potential are used to rank projects based on resilience to sea level rise. Sites more likely to be inundated receive a lower ranking as it is seen as a poor investment of restoration effort. For wetland projects (salt or fresh) this low ranking due to inundation from sea level rise is offset by the provision of additional points for sites with the potential for inland migration.	Projects are scored based on maximum depth of SLR without inundation of site as follows: Inundated at 1ft SLR = 0 Inundated at 2ft SLR = 1 Inundated at 3ft SLR = 2 Inundated at 4ft SLR = 3 Inundated at 5ft SLR = 4 Inundated at 6ft SLR = 5 Not inundated at 6ft SLR = 6 For projects comprised of natural systems with migration potential (wetlands, beaches, streams, ponds) additional points are added for migration potential as follows using APCC Salt Marsh Migration Potential study results and methodology. High=6 Med=3 Low=0	6	0	Map Layers: 1. SLR layers for 1-6ft (Cape Cod Commission's SLR Note: The 2015 APCC Salt Marsh Migration

Appendix K - Salt Marsh Secondary Ranking Criteria					
Criteria	**Description**	**Ranking**	**Max Score**	**Min Score**	**Source of Information for Ranking**
Resilience to Erosion	Project sites are ranked based on trends and rates of accretion versus erosion at project sites as a measure of resilience to erosion. Sites that are eroding quickly and may not persist long into the future are scored lower. Sites gaining land (accreting) were scored higher as they are more likely to persist over time and therefore a better investment for restoration.	Score projects that are within 100ft of coastline based on shoreline change. Distance from the coast was measured using the ArcGIS Online measuring tool. Accreting or more than 100ft from shoreline = 5 Very low erosion (<0.25 ft/yr) = 4 Low erosion (0.25 to 0.5 ft/yr) = 3 Medium erosion (0.51 to 1 ft/yr) = 2 High erosion (>1 ft/yr) = 1	5	1	Map layer: 1. MA CZM shoreline change Note: Use CZM's MORIS webmap to
Local Support (community or partner)	Project feasibility and human use/interest indicated based on presence of community or other partner support, including not only positive support but also consideration of known opposition or views by project abutters	Yes, specific community support expressed or partner(s) identified = 5. Some or medium support, general interest expressed or interest from single individual, OR Don't Know/Lack Info = 3. No support or opposition = 1.	5	1	Inventory - Potential Partners, Description, Status, Comments
Town Priority	Projects that are higher priority for the town are more feasible and of greater importance and so subsequently are given higher ranking.	High (Identified as high or #1, #2 on town list or for that type of proejct) = 5. Medium, Don't Know, or Lack Info (unless otherwise indicated by town, projects underway were given medium score) = 3. Low = 1	5	1	Inventory - Town Priority