

Chapter 8

RECOMMENDED PLAN

8.1 PURPOSE AND SUMMARY

NRCS developed the Cape Cod Water Resources Restoration Project in coordination with the local sponsors: Cape Cod Conservation District, Barnstable County Commission, the 15 towns of Barnstable County, and the Executive Office of Environmental Affairs, represented by the Office of Coastal Zone Management, and Division of Marine Fisheries. Both NRCS and the local sponsors support the goals and objectives of the Cape Cod Water Resource Restoration Project and are committed to supporting the individual restoration projects through funding, technical assistance, project implementation, and in-kind matches.

The Cape Cod Water Resources Restoration Project includes individual projects for:

- Altering stream crossings to improve tidal flushing at locations where a road has reduced the size of the tidal channel and affected upstream salt marsh hydrology;
- Repairing and upgrading fish passages to restore herring runs; and
- Treating the first flush of stormwater runoff to improve water quality in shellfish areas.

NRCS and the sponsors started with lists of 182 tidally restricted salt marshes, 93 fish passage obstructions, and 158 stormwater discharge sites at shellfish beds. After a screening and ranking process, the recommended plan includes 26 priority salt marsh restoration projects, 24 priority fish passage obstruction remediation projects, and 26 priority stormwater remediation projects. The estimated cost of the Project is \$30 million, of which \$24 million would be Public Law 83-566 funds, and the estimated Project duration (for construction of all individual projects) is ten years.

The Project supports the purposes of Public Law 83-566 because Cape Cod has significant land or water management problems that can be solved or alleviated by measures for water quality management and public fish and wildlife. Under Public Law 83-566, the Cape Cod Project must be approved by Congress because the cost exceeds \$5 million.

As required by Public Law 83-566, the Project contains benefits directly related to agriculture because the water quality improvements from the stormwater remediation projects would increase the number of days harvesting would occur in shellfish beds that would otherwise be closed. The Project also would benefit rural communities because each of the towns on Cape Cod has a population less than 50,000.

8.2 MEASURES TO BE INSTALLED

The proposed measures to be installed for the priority projects are summarized in Tables 6-1, 6-3, and 6-5. In general, these projects include:

Salt marsh restoration	Replacement of inadequately sized or failed culverts with larger culverts or bridges
Fish passage obstruction remediation	Reconstruction of failed fishways; replacement of collapsed or improperly aligned culverts; removing restrictions at bridges
Stormwater remediation	Installation of catch basins and infiltration systems (leaching galleys, infiltration pits)

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 tiered to this EIS. In general, construction of each project could cause short-term, minor, adverse impacts to air, noise, vegetation and soils, water quality, and local traffic at the construction site. There would be short-term, minor, beneficial impacts to the local economy from creation of construction jobs. Construction periods would be short, generally one or two weeks to one or two months. The Project complies with the General Conformity Rule for federal projects in nonattainment air quality regions (ozone on Cape Cod). Long-term beneficial impacts of the projects include improved water quality, improved anadromous fish runs, and increased recreational and commercial shellfish harvesting. There are no long-term negative impacts identified at this time, although the specific effects of each project on threatened and endangered species and archaeological and historical sites needs to be investigated further in the site-specific Environmental Evaluations, which would focus on the following resources and issues:

Stormwater remediation:

- Shellfish bed classification and expected water quality benefits
- Required permits; erosion and sediment control
- Threatened and endangered species; Section 7 consultation; time-of-year restrictions

Fish passage obstruction remediation:

- Required permits; erosion and sediment control; mitigation of instream construction impacts
- Archaeological and historical sites; Section 106 consultation
- Threatened and endangered species; Section 7 consultation; time-of-year restrictions

Salt marsh restoration:

- Potential effects of higher groundwater table on wells and septic systems
- Potential effects of converting freshwater wetlands to tidal, salt affected wetlands
- Potential effects of higher water levels in the marsh on improvements around the marsh
- Required permits; erosion and sediment control; mitigation of instream construction impacts

- Threatened and endangered species; Section 7 consultation; time-of-year restrictions
- Essential fish habitat; consultation with National Marine Fisheries Service

The priority projects listed in Section 6.1 may not be the final list of projects that get implemented under the Cape Cod Project. Selection of final projects will depend (1) on which projects are brought forward for final assistance by the towns or EOEAs and (2) on the results of a final, detailed evaluation of each site, including costs and environmental impacts and benefits. 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 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.

8.3 PERMITS AND COMPLIANCE

Specific permitting requirements will be identified in the Environmental Evaluation for each specific project. Because many of the projects involve construction in or near the water, the list of potentially applicable environmental permits, approvals, and consultations includes:

- Section 404/Section 10
- Section 401 Water Quality Certification
- Massachusetts Notice of Intent (state and municipal)
- Massachusetts Chapter 91 Waterways License
- Massachusetts Department of Environmental Protection Environmental Notification Form (Massachusetts Environmental Protection Act)
- Project review filing/conservation and management permit (Massachusetts Endangered Species Act)
- Special permit—anadromous fish passageway
- Coastal zone consistency determination
- Cape Cod Commission Act
- Erosion and sedimentation control plan
- Section 7 consultation, threatened and endangered species
- Section 106 consultation, archaeological and historical sites

Certain federal laws, executive orders, and policies protect specific resources of national importance; for example, wetlands, habitat for threatened and endangered species, and archaeological and historical sites. The Cape Cod Project will comply with all of this national guidance, as summarized in Table B-5 in Appendix B.

8.4 COSTS

Cost sharing between Public Law 83-566 and other sources is shown in Tables 8-1 and 8-2. The estimated total Project costs are \$29,950,000. The estimated construction costs for structural measures total \$17,720,000. The Sponsor's estimated cost of construction is \$4,430,000 and the estimated cost of construction eligible for Public Law 83-566 funding is \$13,290,000.

Ecosystem restoration is not an exact science and stormwater remediation measures and salt marsh restoration measures have a degree of uncertainty (Section 6.5 Risk and Uncertainty). 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. Some additional work may be necessary such as additional treatment facilities (e.g. leaching chambers) for stormwater projects or interior ditching in salt marshes. Adaptive management is also applying the information gained from monitoring to the design of new project sites. The estimated costs of data collection for achieving the planned habitat unit benefits (i.e., adaptive management) total \$1,960,000. Data collection includes environmental surveys of restored salt marshes and water quality monitoring of shellfish areas for defining additional work measures needed to achieve the most benefits at the least costs. NRCS policy (General Manual 190, Part 410.12(a)(4)) supports the use of post-project monitoring to ensure that planning and evaluation procedures have a sound technical basis. Monitoring of selected individual projects will determine whether they are functioning as planned, provide a basis for re-engineering if necessary, and improve the planning and evaluation of later projects.

Construction costs for structural measures are direct costs for installation (Table 8-2). Construction includes such items as excavation and removal of existing under-sized culverts and obsolete fish passage structures, installation of new culverts, fish passage structures and stormwater remediation measures, and seeding of disturbed areas. Engineering services include the direct cost of engineers and other technicians for surveys, investigations, designs, and preparation of plans and specifications for structural measures, including vegetative work and the preparation of operation and maintenance plans. CZM and DMF currently have an effective and efficient program delivery system for restoring salt marshes and anadromous fish runs. Implementation for these projects objectives would capitalize on their experience and existing systems. Their experience provided the basis for estimating the additional costs associated with the complexities of site specific project implementation. Salt marsh restoration projects include an additional project management and engineering cost at 45 percent of construction costs. Anadromous fish run restoration projects include an additional project management and engineering cost at 43 percent of construction costs.

Project administration costs include the cost of contract administration, review of engineering plans prepared by others, contract administrators, and inspection services during construction. The total estimated cost of Project administration is \$4,290,000. The Sponsors estimated cost of Project administration is \$430,000 and the estimated cost of Project administration eligible for Public Law 83-566 funding is \$3,860,000.

Table 8-1
Estimated installation cost – Cape Cod Water Resources Restoration Project

Installation cost measure	Estimated costs ^{1/}		
	PL 83-566 funds (\$)	Other (\$)	Total (\$)
Stormwater Remediation	6,390,000	1,800,000	8,190,000
Fish Passage Obstruction Remediation	4,350,000	910,000	5,260,000
Salt Marsh Restoration	11,340,000	3,200,000	14,540,000
Adaptive Management ^{2/}	1,880,000	80,000	1,960,000
Total	23,960,000	5,990,000	29,950,000

^{1/} Price Base 2006

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^{2/} Adaptive management costs are for marsh vegetation mapping and shellfish embayment water quality sampling and analysis based on CZM and DMF estimates.

Table 8-2
Estimated Distribution of Installation Costs
Cape Cod Water Resources Restoration Project

Installation cost measure	PL 83-566 funds (\$) ^{1/}				Other funds (\$) ^{1/}					Total cost
	Construction	Engineering	Project administration	Total PL 83-566 cost	Construction	Sponsor engineering costs	Land rights	Project administration	Total other	
Stormwater Remediation ^{2/}	4,560,000	1,460,000	370,000	6,390,000	1,520,000	130,000	0	150,000	1,800,000	8,190,000
Fish Passage Obstruction Remediation ^{3/}	2,160,000	920,000	1,270,000	4,350,000	720,000	120,000	0	70,000	910,000	5,260,000
Salt Marsh Restoration ^{4/}	6,350,000	2,790,000	2,200,000	11,340,000	2,120,000	650,000	230,000	200,000	3,200,000	14,540,000
Adaptive Management	220,000	1,640,000	20,000	1,880,000	70,000	4,000	0	7,000	80,000	1,960,000
Total	13,290,000	6,810,000	3,860,000	23,960,000	4,430,000	900,000	230,000	430,000	5,990,000	29,950,000

^{1/} Price Base 2006; total costs does not equal the sum of the project costs in Tables 6-1, 6-3, and 6-5 because of rounding

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^{2/} See Table 6-5 for specific site descriptions and costs

^{3/} See Table 6-3 for specific site descriptions and costs

^{4/} See Table 6-1 for specific site descriptions and costs

Land rights costs are direct and related costs for the right to install, operate, and maintain works of improvement. It is anticipated that all work will be on public land or land already under agreement for works of improvement and there are no costs anticipated for land rights other than the costs for re-locating some buried utilities during construction..

Sponsor engineering costs are the estimated costs for the sponsor to obtain permits for the works of improvement. This cost is estimated to be \$25,000 for each salt marsh restoration site, \$5,000 for a fish passage site and \$5,000 for a stormwater remediation site.

8.5 INSTALLATION AND FINANCING

Installation

Works of improvement will be installed over a ten-year period following authorization of federal assistance under the Watershed Protection and Flood Protection Act, Public Law 83-566. Installation of the works of improvement is voluntary and specific projects will be brought forward for technical and financial assistance by the towns or EOEAs. Installation of the works of improvement will vary from year to year based on the availability of sponsor and federal funds. It is anticipated that the average annual amount will be \$3.0 million.

Responsibilities

Responsibilities for carrying out a site-specific project will be shared between the Natural Resources Conservation Service and the Sponsors as follows:

NRCS

- a. Provide overall Project administration.
- b. Provide engineering design and construction inspection for works contracted by NRCS.
- c. Provide engineering designs for works contracted by Sponsors.
- d. Provide funds to Sponsors for preparing engineering designs and construction inspection for works contracted by Sponsors.
- e. Provide up to seventy-five percent (75%) of the total construction costs. The cost share rate is to be commensurate with other national programs at the time of signing project agreements.
- f. Provide funds to Sponsors to collect data necessary for adaptive management of water quality improvement measures for shellfish areas and adaptive management for restoring salt marshes.
- g. Provide funds to Sponsors for project management and engineering typically performed by NRCS to implement projects.

Sponsors

- a. Provide at least twenty-five percent (25%) of the total construction costs.
- b. Be responsible for their Project and contract administration costs for installing works of improvement.
- c. Acquire any land rights necessary for installing the works of improvement.
- d. Bear the costs of relocating or modifying utilities.
- e. Secure all required federal, state and local permits.

- f. Be responsible for operation and maintenance of all components of installed works of improvement.
- g. Be responsible for their Project and contract administration costs for collecting data necessary for adaptive management of water quality improvement measures for shellfish areas and adaptive management for restoring salt marshes.
- h. When funded by NRCS, provide project management and engineering typically performed by NRCS to implement projects

Contracting

Each site-specific project or groups of projects will be constructed through project agreements between NRCS and the Sponsor for that site by means of a federal contract, local contract, division of work, or force account.

Land Rights

The Sponsors will be responsible for acquiring the land rights and rights-of-way necessary to install, operate and maintain the works of improvement. The Sponsors will also be responsible for the satisfactory relocation or modification of all utilities disturbed as a result of the project.

8.6 OPERATION AND MAINTENANCE

Operation includes the administration, management, and performance of non-maintenance actions needed to keep each completed practice safe and functioning as planned. Maintenance includes the performance of work, preventing deterioration of installed practices, and repairing damage or replacement of the practice if one or more of its components fail. Damages to completed practices caused by normal deterioration, drought, flooding, sedimentation or vandalism are considered normal maintenance.

The Sponsor's liability for O&M extends throughout the actual life of the installed practice. A separate O&M agreement will be developed for each site specific or group of site, and signed prior to construction of that site. The agreements will provide for inspections, reports, and procedures for performing the maintenance items. An O&M plan will be included with the agreement. Operation and maintenance of stormwater remediation measures is critical to the success of reducing pollutant loadings to shellfish areas. O&M agreements will have strict requirements for Sponsors to inspect and perform maintenance work (e.g. removing sediment from catch basins). Each practice is to be inspected on a regular scheduled basis, and immediately following major storms, earthquakes or other occurrences which may adversely affect the practice.

The estimated average annual operation and maintenance costs are \$1.8 million (Table 8-3, evaluated for a 50-year period).

Table 8-3
Estimated average annual costs – Cape Cod Water Resources Restoration Project

Installation cost measure	Amortization of installation costs (\$)	Operation, maintenance and replacement costs (\$)	Total (\$)
Stormwater remediation	439,800	106,500	546,300
Fish passage obstruction remediation	281,900	47,300	329,200
Salt marsh restoration	781,000	25,200	806,200
Adaptive management	105,000	0	105,000
Total	1,607,700	179,000	1,786,700

Based on 50-year project evaluation period.
Discount rate of 4.875%.
Price base is 2006.

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