



QUESTIONS & ANSWERS

What area is included in the project?

The Cape Cod Water Resources Restoration Project includes all of Barnstable County - also known as Cape Cod - excluding federal lands.

What are the objectives?

- Improve water quality for shellfish areas
- Restore anadromous fish runs
- Restore tidal flow to restricted salt marshes

How were the sites selected?

Stormwater discharge sites affecting shellfish beds were identified by Massachusetts Division of Marine Fisheries biologists and town resource officials.

Tidally-restricted salt marshes were identified using two inventories of tidally restricted salt marshes published by the Cape Cod Commission and the Buzzards Bay Estuary Project.

Restricted fish passages were identified by the Massachusetts Division of Marine Fisheries in their survey of anadromous fish passages on Cape Cod and the Islands.

Is the work really necessary?

Stormwater runoff is a significant source of pollution in coastal areas. Some shellfish beds are closed for extensive periods during the year because of poor water quality.

Many culverts throughout Cape Cod are under-sized and severely restrict natural tidal flow to salt marshes. In many cases, this change in tidal flow has caused severe degradation of the salt marsh and the important ecological services that it provides. Removing tidal restrictions by installing larger culverts will provide important ecological benefits.

Anadromous fish have experienced declines over the last century due to poor water quality and dams that block passage. River herring, specifically, have

shown a significant decrease in abundance in recent years.

Many of the over 175 fish passage structures on the coastal streams of Massachusetts need to be replaced or repaired to allow species such as river herring to reach their spawning habitat. Cape Cod has some 40 herring runs and 100 obstructions to passage.

The large number of river herring populations and potential restoration sites on Cape Cod make it an ideal location for this type of project.

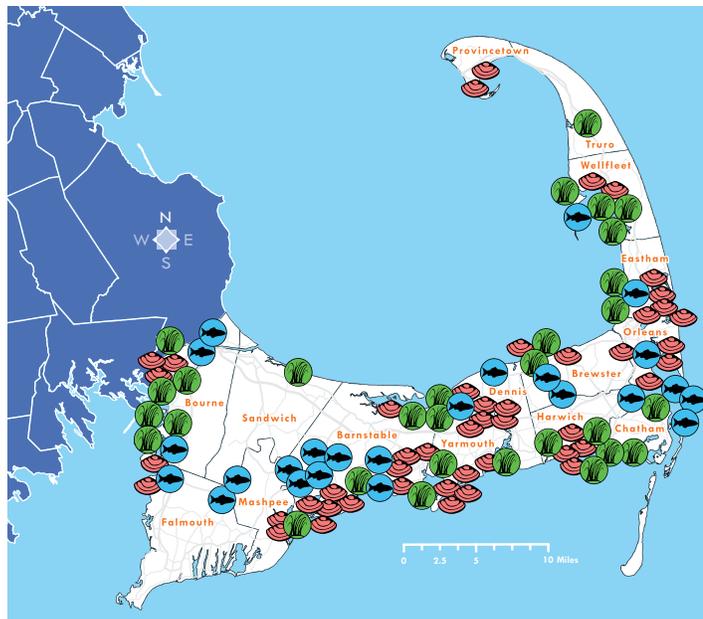
What is fish passage?

Anadromous fish such as river herring migrate from the ocean to freshwater areas to spawn. Physical obstructions such as dams or misaligned road culverts create barriers and prevent fish from moving upstream. Structures such as fish ladders, man-made channels and repositioned culverts allow fish to swim beyond the barriers.

The U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS), in partnership with the Cape Cod Conservation District and the Barnstable County Commissioners, has begun an estimated \$30 million project that will restore 1,500 acres of degraded salt marsh, improve fish access to 4,200 acres of spawning habitat, and improve water quality for 7,300 acres of shellfish beds over 10 years.

Short-term economic benefits are expected, as well, from the creation of construction jobs.

Some \$6.5 million in Recovery Act funding allowed work to begin in 2010 on 25 of the 76 proposed project sites.



PRIORITY SITES FOR ECOSYSTEM RESTORATION

LEGEND

- Shellfish Sites
- Salt Marsh Sites
- Fish Passage Sites



What is a stormwater discharge site?

Stormwater runoff is the water from rain and snow melt that flows across land. Pollutants that have been deposited on land are carried by runoff into nearby rivers, streams, lakes, ponds, wetlands, marine waters and groundwater. This contaminated runoff significantly degrades water quality and aquatic habitat.

In Massachusetts, stormwater runoff and discharges from stormwater drain pipes are the largest contributor to water quality problems in the Commonwealth's rivers, streams and marine waters.



Degraded fish ladders block river herring from upstream spawning grounds.



Reconstructing fish ladders will restore access to freshwater spawning habitat.

What does a degraded salt marsh look like?

Salt marshes with restricted tidal connections to the ocean have unnatural flooding regimes, alterations of soil and water chemistry and changes to plant and animal communities. The resultant changes to soil and water chemistry and plant community leads to reduced use of the marsh by birds, invertebrates and fish. One of the primary indicators is the proliferation of *Phragmites australis* (Common reed).

What should a healthy salt marsh look like?

An undisturbed salt marsh is typically laced with tidal creeks that drain fresh water from the marsh and allow tidal water to be distributed throughout the wetland. The plant community is relatively homogeneous and is dictated by salinity levels.

Spartina alterniflora (smooth cordgrass) dominates the low marsh (flooded at each high tide or twice daily) and *Spartina patens* (salt meadow cordgrass), *Distichlis spicata* (salt grass) and *Juncus gerardii* (black grass) are predominant in the high marsh (inundated every few weeks).

The marsh border, typically only flooded at extreme high tides or storm surges, has a more diverse plant community including: *Panicum virgatum* (Switchgrass), *Iva frutescens* (high tide bush), *Baccharis halimifolia* (sea myrtle) and *Solidago sempivirens* (seaside goldenrod).

How long has it taken for these problems to occur?

Many of the salt marsh sites have been hydrologically restricted for decades; however, once the natural tidal flushing is restored (along with the resultant increase in salinity), the invasive plants die off relatively quickly and re-colonization of the natural vegetation occurs.



Stormwater runoff is a significant source of pollutants. Shellfish beds are often closed for extensive periods because of poor water quality.



Dry wells and sand filters protect shellfish beds from polluted stormwater runoff.



Under-sized culverts are barriers to tidal flow and fish migration. When tidal flow is restricted, salt marsh ecosystems become degraded.



Phragmites australis (Common reed) has taken over this degraded salt marsh where natural tidal flow was restricted.



Tidal creeks drain fresh water and distribute tidal water in a healthy salt marsh.



Installing larger culverts will restore normal tidal flow to salt marsh ecosystems.

What are the potential benefits of restoration?

Hydrologic restoration of salt marshes will improve water quality, provide improved shorebird, waterfowl, finfish and shellfish habitat and offer recreational opportunities and aesthetically pleasing open coastal spaces.

Stormwater remediation measures will improve water quality and decrease the number of days shellfish beds are closed, and in some cases decrease the closure days of public beaches.

River herring are a forage species for many recreationally and commercially important fish such as striped bass, bluefish, and Atlantic cod.

Sport fishermen have documented an increase in the number of trophy sized fish such as largemouth bass and pickerel in ponds where juvenile herring are present.

River herring have been an important baitfish for the commercial lobster and recreational striped bass fisheries. Since 2006, a statewide moratorium on the harvest of river herring has been in place due to declines in river herring populations.

Restoring access to spawning and nursery habitat can result in an increase in the size of local populations.

River herring are culturally important on Cape Cod as a food source and a harbinger of spring. They were a traditional sources of sustenance and their roe was favored by many as a spring delicacy.

How long will it be before benefits are seen?

It typically takes one to three years for salt marsh restoration and water quality improvements to be seen. Changes are dependent on weather, how degraded a site is at the time of restoration and other factors. Fish passage improvements will provide immediate access to spawning areas.

Are these problems a hazard to wildlife, public health or my property?

The proliferation of invasive plant species, which offer little wildlife food value as compared to native plant species, results

in reduced use of the marsh by wildlife. In addition, common reed may pose a fire hazard due to the dried stems. The tidal restriction could also pose a flooding hazard by allowing stormwater runoff to pond in the marsh because of inadequate culverts.

Are these problems affecting my property value?

The visual and aesthetic properties of a natural salt marsh could increase property values as a result of improved views.

Will the view from my property change?

Typically stormwater remediation measures are installed underground and only the manhole covers are visible after construction. Sometimes wetlands are constructed to treat runoff when soil conditions are not suitable for infiltration.

Restored salt marshes will undergo a fairly rapid change in the plant community, from predominately invasive species (especially common reed) to the natural salt marsh grasses. The salt marsh grasses are shorter in height, which will result in a more open view.

Reconstructed fish ladders and other fish passage projects will only be visible from the immediate area of installation.

What will the restoration work entail?

Tidal flow to salt marshes is typically accomplished by replacing existing culverts with larger culverts. Stormwater runoff is usually treated by collecting the first one-half inch to one inch of runoff and infiltrating it into the ground. Passage for river herring can be improved by various techniques such as removing an obstruction, installing a fish ladder, constructing a bypass channel, or repairing a culvert.

Will the government need access to my land to work at a nearby site?

Generally no, but temporary access may be needed.

NUMBER OF THREATENED SPECIES

Fish	4	Segmented worms.....	1
Amphibians	3	Freshwater mussels	4
Reptiles	3	Crustaceans	1
Birds.....	21	Insects	31
Marine mammals	1	Plants.....	63

What if I don't want to allow someone on my property?

If you don't sign a written permission to allow access on your property, then no one will go on your property.

Will the work involve noise, or dust?

Construction will involve using heavy equipment and there can be noise and dust during construction. Construction can be completed in a few days at some sites, although large or complex sites may take longer.

Will the work affect roads and/or traffic?

Construction will most likely affect roads and traffic temporarily.

When will the restoration work begin?

Construction is expected to begin in Spring 2011.

How long will it take?

The project is anticipated to take place over 10 years. The actual rate of work is dependent on funding (local, state and federal).

How much will this work cost?

The estimated cost to implement the entire project is \$30 million over 10 years.

Who will pay for the restoration work? Will my town have to contribute?

Planning and design work can be a 100 percent federal cost. Permits and land rights are a 100 percent local cost. Construction costs are split 75 percent federal and 25 percent local.



Who pays for preparing designs?

Planning and design work can be a 100 percent federal cost.

Who will do the work?

Any town in Barnstable County or unit of state government may sponsor a project. The actual construction work can be done by town departments, town contracts, federal contract, or a combination of these options.

What is a sponsor?

A sponsor is a legal entity which has the ability to obtain land rights, and operate and maintain the projects.

Besides cash, how can sponsors contribute the local cost share?

Through in-kind services such as:

- Design preparation
- Contract administration
- Supply materials
- Traffic control
- Disposal site for excess/unsuitable materials
- Construction

How can I get “my” site looked at?

Contact the USDA Natural Resources Conservation Service. Contact information is below.

Was “my” site looked at already?

If your site is a salt marsh and is listed in either the *Cape Cod Atlas of Tidally Restricted Salt Marshes* or the *Buzzards Bay Watershed Atlas of Tidally Restricted Salt Marshes*, then it has been reviewed.

If your site is a fish passage obstruction and is listed in the Division of Marine Fisheries Survey of Anadromous Fish Passage in Coastal Massachusetts, then it has been reviewed.

If your site is not listed or involves stormwater runoff affecting a shellfish area, contact the USDA Natural Resources Conservation Service.

How do I get “my” site worked on?

Contact your town selectboard member and ask them to have the town sponsor the site.

ESTIMATED COST & CONTRIBUTIONS

Total federal funds	\$23,960,000
Total non-federal funds	\$5,990,000
Total estimated cost	\$29,950,000

What if I don't want “my” site worked on?

Contact your town selectboard member and ask them to have the town not sponsor the site. Also contact the USDA Natural Resources Conservation Service and inform them. All work is voluntary.

Are permits needed for construction?

Yes, prior to any project construction, all necessary local, state and federal permits must be obtained.

Who obtains permits?

The town or other local sponsor is responsible for obtaining all required permits, as well as land rights. The cost for permitting and land rights are a 100 percent local cost.

Aren't there other agencies and programs already doing this work?

Yes, however the number of sites needing work exceeds the resources currently available to address the problem in a reasonable period of time. We are working closely with other agencies to efficiently share resources.



Project Partnership

Sponsors

- Barnstable County Commissioners Coastal Resources Committee
- Cape Cod Conservation District
- Executive Office of Energy and Environmental Affairs
- All 15 towns across Cape Cod
- USDA Natural Resources Conservation Service

Cooperating agencies

- Mashpee Wampanoag Tribe
- Massachusetts Department of Fish and Game
 - Division of Ecological Restoration
 - Division of Marine Fisheries
- Massachusetts Department of Environmental Protection
- Massachusetts Highway Department
- Massachusetts Office of Coastal Zone Management
- National Oceanic and Atmospheric Administration
- National Park Service
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service

Contact Information

Cape Cod Conservation District

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Barnstable County Commissioners

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USDA Natural Resources Conservation Service

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