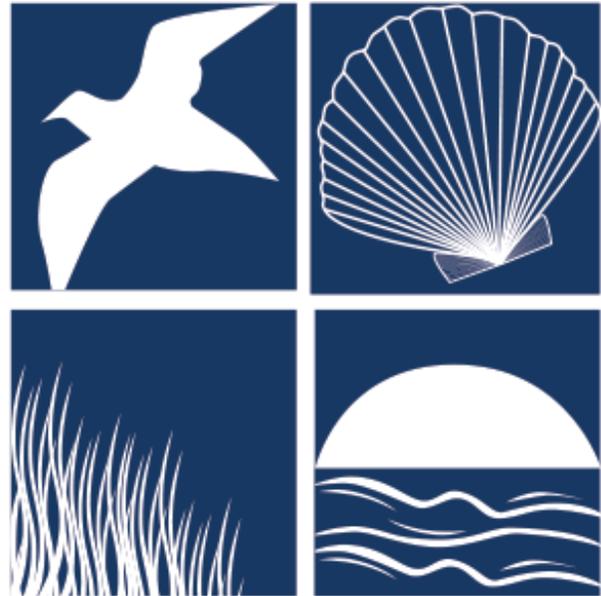


Shorelines: Spring 2015 Newsletter

apcc.org/newsletters/2015-spring.html



Coastal resiliency project studies role of natural communities

APCC is conducting a field survey along the town of Brewster's coastline to identify and map natural vegetative communities that could help protect against climate change and sea level rise.

Cape Cod is already experiencing the effects of climate change in the way of rising sea levels, coastal erosion, flooding and an increased intensity and frequency of storms. To cope with this new reality, towns on Cape Cod are beginning to factor climate change preparedness in their planning, including ways to improve the resiliency of their coasts.

Coastal resiliency is the ability to survive and adapt to the adverse impacts of changing coastal conditions brought about by climate change. One way a town can address recurring coastal erosion and threats of flooding is through "green infrastructure." Green infrastructure is defined in this instance as the utilization of naturally functioning systems that provide ecosystem services to the community, such as protective buffers to flooding.

Natural vegetated communities offer a sustainable green infrastructure approach to enhancing coastal resiliency. For example, salt marshes store flood waters, reduce storm surge damage and filter pollutants and excess nutrients. Another natural community system

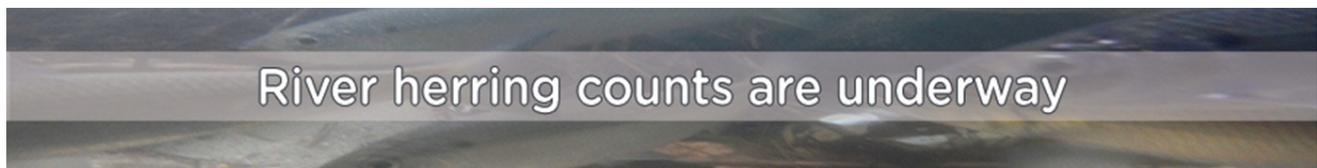
—the maritime dune—acts as a barrier against storm surge flooding, and vegetation growing on the dune helps stabilize and anchor it in place.

Healthy ecosystems provide better “services” than impaired ecosystems, so in the example of salt marshes, protection and restoration become very important components of a town’s ability to prepare for natural disasters.

In the past several years, the town of Brewster has sustained erosion and damage to public and private property along the coast. In some areas as much as 20 feet of shoreline has been lost. APCC received a grant from the Mary-Louise Eddy and Ruth N. Eddy Foundation to identify natural communities that play a role in protecting Brewster’s coast and improving coastal resiliency against powerful storms. Our goal is to provide the town with recommendations for increasing coastal resiliency and habitat value through the protection of natural communities.

To accomplish this, we will compare the presence and type of natural communities along the Brewster shoreline with shoreline erosion in order to identify natural communities that play a role in improving coastal resiliency. We will look at whether there is a relationship between the type of vegetative cover (i.e. natural community) and the degree of shoreline erosion and change, and whether certain types of natural communities occur in areas that are experiencing a buildup of sediments verses areas that are experiencing sediment loss.

APCC will share its data with the town and provide outreach programs to the public through several workshops. We anticipate the results will be transferable to other Cape Cod towns, and plan to use this integrated coastal program as a model for other towns as they plan for coastal resiliency and protecting natural resources.



Since 2007, APCC has organized annual volunteer herring counts and helped other organizations set up their own counts. To date, of the 16 runs being monitored, 13 are monitored by APCC or our partners. These include runs in Wellfleet, Eastham, Orleans, Harwich, Brewster, Dennis, Yarmouth, Barnstable, Sandwich, Falmouth and Mashpee. This spring, APCC continues to work with local volunteers to conduct herring counts along these runs.

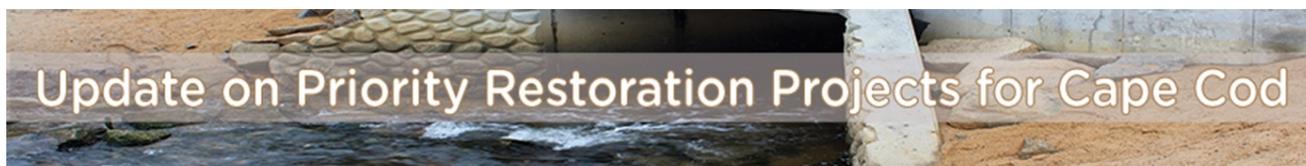
Herring counts are used to estimate the number of herring that migrate upstream. Run sizes are used by local, state and federal fisheries managers to better understand, manage and protect herring habitat and populations. Herring counts also help to document the success of restoration projects or set the stage for planning restoration projects.

Last year, some runs on Cape Cod saw significant increases. These included the three largest runs on Cape Cod—Mashpee River, Stony Brook run in Brewster, and Herring River in Harwich—at each of these, run sizes increased by more than 100,000 over previous years. The increase at Stony Brook (which was restored between 2010 and 2013) was particularly dramatic—from tens of thousands before restoration to over 271,000. Other runs in Wellfleet, Orleans and Mashpee saw modest increases from previous years. Runs in Eastham and Yarmouth were monitored for the first time.

For more information on APCC’s herring count program and to see a list of the many organizations and towns participating in the program, go to www.apcc.org/herring, or contact APCC senior scientist/Mass Bays Program regional coordinator Dr. Jo Ann Muramoto at (508) 362-4226 ext. 16.

This table shows the 2014 run size estimates and whether population numbers increased (+) or decreased (-) from 2013.

| Run Location | 2014 Estimated Run Size |
|------------------------------|--------------------------------|
| Stony Brook (Brewster) | 271,363 (+) |
| Bound Brook (Dennis) | 16,117 (-) |
| Herring Brook (Eastham) | 8,188 (first counting year) |
| Herring River (Harwich) | 247,894 (+) |
| Mashpee River (Mashpee) | 341,458 (+) |
| Quashnet River (Mashpee) | 40,854 (+) |
| Santuit River (Mashpee) | 20,620 (no data for 2013) |
| Pilgrim Lake (Orleans) | 4,202 (+) |
| Herring River (Wellfleet) | 61,781 (+) |
| Tom Matthews Pond (Yarmouth) | 70,169 (first counting year) |



APCC has been working with the Cape Cod Conservation District to update the list of priority coastal restoration projects for the Cape Cod Water Resources Restoration Project. This update is being done to ready projects for the next round of funding.

The Cape Cod Water Resources Restoration Project (CCWRRP), which is administered through the USDA Natural Resources Conservation Service, is a Congressionally-authorized \$30 million Cape-wide restoration program that will restore tidally-restricted salt marshes and impaired fish runs, and improve water quality for shellfish beds by treating stormwater discharges. Phase one of the project produced 24 construction projects and 10 feasibility studies, which restored 44.5 acres of salt marsh, 3,868 acres of shellfish beds, 186 acres of fish spawning habitat, and treated stormwater runoff from 29.8 acres of impervious area.

APCC and the Conservation District met with town staff to identify restoration priorities and received input from state partners at the Division of Marine Fisheries and Division of Ecological Restoration. Over 110 projects were identified from the 15 Cape towns. Half are stormwater projects, one quarter are salt marsh restoration projects, and one quarter are fish run restoration projects.

Next, projects will be ranked, with input from the Barnstable County Coastal Resources Committee. The resulting list of priority projects will be used to obtain phase two funding, which is dependent upon Congressional appropriation.

For more information, contact Dr. Jo Ann Muramoto at (508) 362-4226 ext. 16.



APCC is a member of the Stakeholder Working Group for the update of Cape Cod's Regional Policy Plan, the Cape's regional planning and regulatory document that provides a blueprint for growth and natural resource protection.

The working group is charged with providing input to the Cape Cod Commission during the drafting of the plan update. The final product will result in policies that will shape the Cape for decades to come.

As a working group member, APCC's priority is to ensure that existing natural resource protection in regional planning goals and in regulatory review standards are preserved in the updated plan, and are improved where needed. APCC is also interested in making sure the Regional Policy Plan update dovetails effectively with the Section 208 Cape Cod Area-Wide Water Quality Management Plan process, which will establish a regional strategy for addressing the Cape's wastewater-related water quality issues.

The working group is made up of various stakeholder constituencies, including elected or appointed officials, municipal employees, the real estate community, the environmental community, the development community, development-related consultants, attorneys, special interest groups and interested citizens.

The first series of meetings were held in March and April. Public participation in the Regional Policy Plan update is strongly encouraged. A schedule of future meeting dates and locations is available on the [Cape Cod Commission's website](#).



The state legislature's 2015-2016 session got underway in January with thousands of bills filed by legislators, including several environmental bills that APCC is watching very closely.

In the months ahead, we will alert our members when hearings and crucial votes are scheduled, and provide information on recommended actions to take. To make sure you receive timely messages about these bills as well as other important environmental news affecting Cape Cod, send your updated email address to info@apcc.org.

The following are some of the bills on APCC's list of priority legislation.

Land Use and Zoning Reform:

A priority of APCC's for several years, **An Act Promoting the Planning and Development of Sustainable Communities** provides much-needed updates and improvements to existing state land use laws that determine how effectively communities plan for growth and protect their natural resources. APCC is working closely on this issue with state senator Daniel Wolf, who filed the bill.

Climate Change Adaptation Planning:

An Act Providing for the Establishment of a Comprehensive Adaptation Management Plan in Response to Climate Change requires Massachusetts to develop a plan that would ensure that the state's infrastructure, transportation networks, energy supply, coastal protection, weather warning systems and emergency management are prepared to meet present and future climate change challenges.

Pilgrim Nuclear Power Plant legislation:

Four bills—An Act Establishing a Fee on the Storage of Spent Nuclear Fuel in Pools, **An Act Increasing Nuclear Power Plant Protections to a Fifty Mile Radius**, **An Act Establishing Funding to Provide Moneys for Postclosure Activities at Nuclear Power Stations**, and **An Act Relative to Radiological Air Monitoring**—address safety measures at the nuclear power plant in Plymouth. In a 2014 study, APCC identified potential environmental threats to the Cape’s natural resources if a nuclear accident occurred at the plant.

Vegetation Management Act:

This bill, **An Act Relative to Vegetation Management**, requires a public utility or other entity proposing a vegetation management program to negotiate with any community that does not want the entity to use chemicals within that community.

No net loss of public lands:

An Act to Protect the Natural Resources of the Commonwealth requires that protected public natural resource lands under Article 97 of the Massachusetts Constitution be replaced by land of equal natural resource value when a change of use or loss of protections of the original land occurs through an act of the legislature.

Community Preservation Act funding:

The state funds providing a match to local CPA funds are derived from a percentage of the fees collected at the Registry of Deeds. In recent years, the state match to towns has decreased substantially. **An Act to Sustain Community Preservation Revenue** will help increase the state funds to at least a 50 percent match of local funds through an adjustment in the Registry of Deeds recording fees.

State budget:

APCC will weigh in on the state budget process, advocating for funding to support environmental programs, including open space preservation and ecological restoration projects on Cape Cod. The governor submitted his budget in March, and the state legislature is now working on its version.



Last month, the completed Section 208 Cape Cod Area-Wide Water Quality Management Plan was submitted to the Massachusetts Department of Environmental Protection (DEP). The plan includes an analysis of the Cape’s wastewater-related water quality problem and

potential solutions for treating wastewater and reducing the amount of nitrogen pollution in the Cape's coastal waters.

The 208 plan also describes the designation of wastewater management agencies, which will have the authority to implement plans for addressing water quality issues in designated areas. Creation of the wastewater management agencies is the most critical step in the planning process, since the agencies will have the responsibility of raising revenues and operating technologies for treating wastewater.

What is not decided at this point is if the wastewater management agencies will consist of cooperatives of towns working together in shared watersheds, or if each of the Cape's 15 towns will be designated as its own wastewater management agency. To answer this important question, the Cape Cod Commission is creating regional teams from the Cape's towns to help make the determination.

After the agencies have been designated, the completed 208 plan must be approved by DEP and certified by the governor by June 15. At that point it will be submitted to the U.S. Environmental Protection Agency for review and approval before a September 15 deadline.

Throughout the drafting of the 208 plan, APCC participated on a committee to develop protocols for monitoring the effectiveness of technologies used to treat wastewater and remove nutrients. Going forward, APCC is committed to providing continued education and outreach on the necessity to develop effective and cost-efficient watershed-based solutions for this region-wide environmental challenge.



There are certain signs of spring we all know and eagerly look forward to: the return of the ospreys, the siting of the first river herring, the sound of spring peeper frogs. But there's another, earlier harbinger of spring that's just as miraculous but not so well known, and that's the sprouting of skunk cabbage in Cape Cod wetlands.

In the dead of late winter, the hooded, other-worldly-looking spathe of the skunk cabbage (*Symplocarpus foetidus*) emerges from the mucky soil of freshwater wetlands and stream banks, often through an icy mantle of snow. The skunk cabbage can do this because it is one of only a very few plant species capable of generating its own heat—upwards of 70 degrees Fahrenheit—even while the surrounding air is frigid and the ground is frozen solid. Inside the spathe is a club of flowers without petals called a spadix, which emits what many liken to an aroma of rotting meat that attracts carrion-seeking pollinators such as flies and beetles. The internal furnace of the skunk cabbage helps “enhance” the fragrance.

After the flowers bloom, the plant produces large, broad, bright green leaves that would look more at home in a tropical rain forest, especially when the plant is found growing in lush colonies. And, true to its namesake, the leaves produce a foul odor when stepped on or damaged.

As the weather warms and most plants have entered their peak growing season, the skunk cabbage begins to fade, its water-rich leaves literally dissolving and blending with the soil. At the height of summer, the plant that was the first to herald the coming of spring has all but vanished, its ephemeral qualities a fitting example of the unique nature of our diverse, yet very fragile, Cape Cod wetlands.



Local businesses understand that on Cape Cod the environment is the economy. That's why the following local businesses support the work we do to protect Cape Cod's natural resources and quality of life by donating a percentage of their profits to APCC directly or by offering special incentives to their customers who contribute to APCC. **Click to expand.**



Predicted sea level rise promises to increase instances of beach erosion and flood damage to low lying coastal properties, often with very visible and dramatic results. But, there are other likely impacts that may not be as visible, yet are no less important. Sea level rise also has the potential to affect the Cape's groundwater level, which in turn could impact infrastructure for wastewater, stormwater and drinking water supplies.

In a video entitled [Sea Level Rise: Changing Cape Cod's Groundwater](#), APCC explores the various threats from sea level rise to Cape Cod's natural and built environment.

The video is the most recent in the Saving Paradise mini-documentary series, which was created by APCC and produced by Undercurrent Productions. Funding and other support for the Saving Paradise video series is provided by Cape Cod Five Cents Savings Bank Charitable Foundation Trust, Friendship Fund, Massachusetts Bays Program, Massachusetts Environmental Trust, Prospect Hill Foundation and APCC member dues and donations.