

Action Plan 14. Reducing Beach Debris, Marine Floatables, and Litter in Wetlands

Problem⁹⁰

Each year, thousands of residents and visitors enjoy Buzzards Bay for boating, swimming, fishing, hiking and birding. Many also visit the extensive inland wetlands, waterways, and open space throughout the watershed. Increasingly, litter, marine debris, and disposal of hazardous and non-hazardous waste has degraded these areas. Litter and debris may be conveyed by stormwater systems (Figure 88), and debris can wash ashore with tide (Figure 89). Although litter and debris in wetlands and the marine environment may seem to be a less serious problem than some others facing Buzzards Bay, it is in fact a problem that cuts across many action plans, and contributes to the ever growing garbage patches appearing in ocean gyres, consisting of fine plastic particles and other materials. Litter collection also involves residents and visitors in assuming responsibility and ownership of open space and wetlands they use.

Goal

Goal 14.1 To ensure that Buzzards Bay beaches, coastal waters, and inland wetlands habitat are clear of harmful and degrading levels of marine debris.

Objectives

Objective 14.1. Ensure an adequate number and capacity of waste disposal barrels be provided at public beach and public and private marinas and boat haul-outs.

Objective 14.2. Stormwater discharge BMPs should include strategies to reduce or eliminate discharges of debris and floatables.

Objective 14.3. Encourage fisherman to not dispose of fishing lines, nets, cables, and trash at sea or on shore.

Objective 14.4. Educate the public and businesses on the importance of reducing litter and marine debris discharges and involve them in the potential solutions.

Objective 14.5. Ensure that state and local officials work in concert to reduce litter on public lands, beach debris, and marine floatables.

Objective 14.6. Identify and map important debris location sites, natural collection points, and potential remediation strategies.

Solutions

Reducing litter and trash in the environment is complex and will require better education of the public, property owners, and businesses, and improved collaboration of local government with neighborhood associa-

tion, and non-profit organizations. Implementation of this management plan involves three core strategies: undertaking periodic cleanups, implementing litter prevention programs to ensure both proper trash disposal and encourage waste reduction, and adopting any needed laws and regulations to increase awareness and accountability of litter generators. Government can also set an example in purchasing programs to focus on biodegradables and items less likely to enter litter waste streams.

Costs and Financing

The costs to implement this action plan are nominal; and the focus is to encourage individuals and businesses to take responsibility for the problem, and encourage volunteerism to solve the problem. There are some costs associated with cleanups, expendable supplies, signage, trash removal, and staff time, but some of these costs can be met through adopt a road or wetland programs with businesses and non-profit organizations.

Measuring Success

Measuring success in this action plan is difficult because the amount of litter collected is a function of collection effort. More complex assessments could include evaluations of extent of littering, but programmatic achievements might be easier to track. These could include extent of areas adopted for cleanup, length of beaches cleaned each year, and the number of cleanup events held.

⁹⁰ This action plan was not in the original CCMP.

Background

Local economies that rely on a clean environment, can suffer when litter clutters beaches, wetlands, and open space. This debris is not only an eyesore but also an inconvenience. Boaters and fisherman lose time and absorb the cost of mechanical repairs when floatable debris wraps around propellers and propeller shafts. Towns have to pay personnel to keep beaches, parks, and public lands clean.

Non-biodegradable litter threatens the health of many species of wildlife. Some plastic and rubber items, such as balloons, six pack rings, fishing lines and nets, plastic bags and utensils, are commonly found in U.S. waters, and cause the death through entanglement, suffocation, or digestive tract blockage of marine birds, mammals, and turtles. This plastic and rubber debris often accounts for two-thirds of the volume collected on Massachusetts beaches.

The sources of marine and coastal debris varies from area to area, and is sometimes difficult to pinpoint. Some enters the marine environment from commercial and recreational fishing vessels. Some comes from land sources like beach goers and fisherman. Storm drains and combined sewer overflows are often a locally important source of these items (Figure 88). Inland wetlands and open space are affected mostly by direct dumping (e.g., Photo by Tony Williams.

Figure 89). A summary of debris collected on Massachusetts beaches is shown in Figure 90.

A study of marine debris pollution in the Gulf of Maine by Hoagland and Kite-Powell (1997) concluded that public education campaigns are a key component of any strategy to reduce marine debris. The authors noted



Figure 88. Litter accumulating on a storm drain grate.



Photo by Tony Williams.

Figure 89. Residents may find large accumulations of litter along rivers and at the headwaters of some bays.

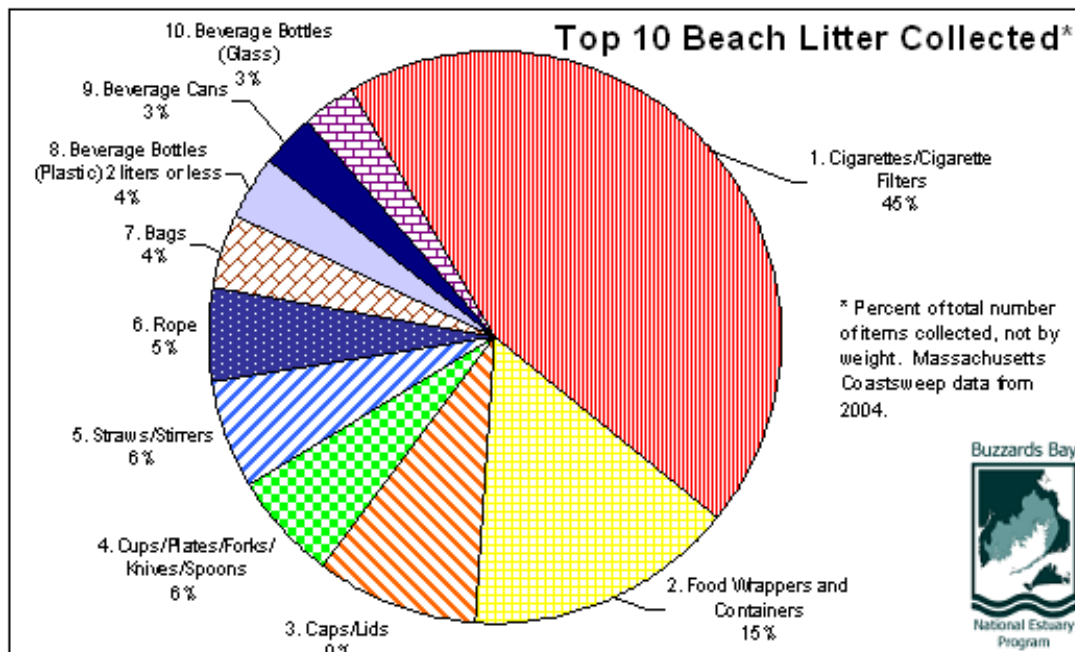


Figure 90. Top ten beach litter types collected in Massachusetts as part of Coast Sweep.

that many managers believe that elementary school programs are among the most effective long-term strategies because it is easier to instill environmental attitudes at an early age. However, strategies targeting adults were identified as equally important. These strategies include "don't litter" messages on product packaging, beach cleanups, educating adults about litter impacts to the environment, educational materials (brochures, flyers, pamphlets, stickers) and specific audiences like fishermen, beachgoers, and boaters. Some of these audiences can be targeted during boat registration, purchase of beach stickers, or shellfishing licenses. In one case users signed a "pledge" not to litter and collect debris they encountered to obtain discounts at marine suppliers.

Few researchers have investigated the effectiveness of various litter reduction campaigns, especially on coastal and wetland areas. Many managers believe that some "educational" strategies, like the posting of littering fines, are more effective than general statements to discourage littering. Such signage is viewed as an important step in areas where littering is prevalent.

Individuals often dump difficult to dispose of items, such as hazardous waste and certain home goods, like television sets, on undeveloped lands and wetlands because of the cost or inconvenience of disposal. We address the financial and other barriers to proper toxic waste disposal issues in the Toxics Reduction Action Plan.

One idea discussed by Buzzards Bay municipalities to address these problems, but rejected, was the idea of forming special committees in every community to address the problems of beach debris, marine floatables, and litter and dumping in wetlands and open space. These officials rejected a blanket recommendation for all Buzzards Bay communities to form these committee because in many cases, the recommendations in this action plan can be achieved through existing boards and personnel (selectmen, town manager, recycling committees). The exception to this rule is that the City of New Bedford and Town of Fairhaven should convene a workgroup to develop a comprehensive strategy to address dumping in New Bedford Harbor, a commercial-industrial seaport.

Since 1982, the Commonwealth of Massachusetts has a five-cent deposit on carbonated beverage containers. Most agree that this law has become less effective because inflation has eroded the value of deposits, and the percentage of bottles returned has declined over time, from a high of 85% in 1995 to less than 68% in 2002⁹¹. Some of the non-returned bottles contribute to litter. Massachusetts legislators have repeatedly introduced legislation to either increase the deposit fee collected to ten cents, expanding the law to include non-carbonated

beverage containers, or to eliminating the fee altogether in favor of a tax to directly fund litter cleanup activity. All these measures have failed.

In many urban and suburban areas, lottery tickets can be a locally important source of paper litter. The Massachusetts lottery has introduced a "instant replay" litter recycling program where 20 used instant lottery tickets could be redeemed for a new ticket. This program has been very successful, but opportunities to redeem the tickets occur at only a few locations on a handful of dates which limits the effectiveness of the program

Table 39. Litter and Trash regulations in the Falmouth Town Code
§ 87-6 Littering. "Leaving litter, trash, rubbish or discarded lunch containers or similar articles upon the public beaches is strictly prohibited."
•Under non-criminal dispositions, littering has a \$50 fine and can be enforced by the health agent.
§ 269-12 (7) water front marine businesses have trash removal as a requirement.
Wetland Stormwater Regulations FWR 2.00 (5): All basins/Ponds designed for stormwater runoff control shall "(d) have outflow pipes designed to minimize clogging (i.e. through the use of trash racks);"

throughout the Commonwealth.

Major Issues

There are few major issues associated with this action plan. Perhaps the most politically controversial related to litter generation and control is whether the bottle bill fees should be increased (currently 5 cents per bottle in MA), or whether non-carbonated beverages should be included in the collection fee. These decisions will need to be made by the legislature.

Another uncertainty is to what degree laws and regulations are needed to enhance accountability of those responsible for trash and litter entering the environment. A special focus should be placed on litter associated with boating activities, or plastics that enter the marine environment because these are becoming increasingly problematic in offshore waters.

Management Approaches

A special focus of litter reduction is removing large and floatable debris out of the stormwater stream. Municipalities should include debris and floatable reduction strategies (e.g. maintenance and installation of litter traps and screens) in their stormwater management plans, including tasks in their MS4 permits plans.

Implementation of stormwater management plans and catch basin maintenance programs may cost municipalities hundreds of thousands of dollars, but the cost of debris removal and catch basin maintenance is typically

⁹¹ This was the last year of the study posted at <http://www.cbri.neu.edu/BottleBillReportFINAL.pdf> (last retrieved 3/16/2011).

a small fraction of overall stormwater management program costs. Municipalities should particularly focus on discharge pipes that need to be remediated in areas of high litter accumulation. This issue is probably best addressed through municipal MS4 stormwater management committees.

Requirements for businesses to provide appropriate waste facilities, or to remove litter from parking lots before it blows on public ways is another important strategy. Many municipalities have special requirements to address this problem in businesses that serve fast food, or at convenience stores, for example.

School departments could institute programs to minimize litter disposal from students including wise buying programs to reduce sources (e.g. purchasing biodegradable items like paper cups instead of plastic foam cups). Schools could also use announcements, signage, and trash barrels at key locations to help modify student behavior.

The Massachusetts Legislature should also review the bottle bill to see if either fee changes or product applicability changes might improve litter source reduction and collection of beverage containers.

Municipalities should provide adequate waste collection barrels at public beaches, public marinas, and boat ramps, and maintain adequate pick-up, especially during heavy use periods. The extent that this service should be provided is often a concern to municipalities because there is a maintenance schedule cost to regularly emptying barrels. Sometimes inappropriate materials are dumped in these containers. When events are held by private groups, municipalities and those sponsoring the events should ensure that proper waste disposal containers are available.

Private marinas and private beach associations also need to provide adequate waste collection barrels and maintain adequate pick-up, or at least put measures in place that users do not leave litter in these areas, and if they do, it is picked up on a regular basis. In general, practices to reduce and manage litter should be left to property owners but towns could facilitate action with education, outreach, and adopting enforceable rules and regulations to reduce litter from chronic sources (Town of Falmouth regulations shown in Table 39).

Financial Solutions

In general, the costs of this action plan are relatively modest, and to a large degree are achieved by more responsible behavior by individuals and businesses. Implementation of beach, upland, and wetland cleanups generally have nominal costs as these programs utilize volunteers, but would have costs associated with expendable supplies, signage, and salary of a coordinator, perhaps totaling \$50,000 annually for a Buzzards Bay watershed directed effort, but the costs would be less if municipal agencies or NGOs helped coordinate citizens

Litter Cleanup as Part of the 2011 Marion Arbor Day Celebration

As part of its annual Arbor Day celebration, the Town of Marion posted this information on its website about the annual event in 2011:

“Sponsored by the Marion Tree and Parks Committee, the DPW, the Marion Natural History Museum, the Sippican Lands Trust, Sippican Historical Society, Lockheed Martin and the Marion Garden Group, the day will be one of town-wide cleanup of the debris left in winter’s wake along Marion’s roadsides. Event representative Tinker Saltonstall urges residents to “please gather your family and your neighbors, rally the classes and Scout troops, and do your part to spruce up Marion for the summer months around the corner.” Participants will gather at the Music Hall on Front Street to receive their safety bibs, bags and gloves before heading to their assigned clean-up territories. Litter collected will be returned to the bandstand area of Island Wharf Park (across from the Music Hall) to create the trash mountain that stands each year as a visual testament to not only the stunning amount of litter left on town roadways by careless individuals, but also the dedicated efforts of caring individuals and organizations within the community toward preserving the health and beauty of Marion’s picturesque landscape.”

at no cost, as part of their normal operation budgets. A possible effective strategy could also involve “adopt a road” (or park or beach or wetland) programs for businesses with signage, as is now done on some highway systems. The net cost or any changes of the bottle bill to businesses and the consumer will depend on how the law might be changed.

Monitoring Progress

Measuring success in this action plan is difficult because the amount of litter collected is not an appropriate measure for this action plan, because the volume of litter collected is a function of effort. Some measures like evaluating sites for litter or ensuring that adequate waste receptacles are available could be used, but defining success is subjective. Other actions are easier to track, such as programmatic action: the number of communities that include a stormwater debris and floatable reduction element in their MS4 plans, the number of annual and beach cleanups and the amount of trash collected in beach and wetland cleanups, the amount of public participation in beach cleanups and the percent of Buzzards Bay adopted. The Buzzards Bay Coalition and other NGOs continue to organize annual beach cleanups to keep Buzzards Bay clean, and raise public awareness

of the problem through adopt-a-shoreline and similar programs.

prepared for the U.S. Gulf of Maine Association under contract no. GM 97-13 by Woods Hole Research Consortium, 168 Alden Street, Duxbury MA 02332-3836.

References Cited

Hoagland, P. and H. L. Kite-Powell. 1997. Characterization and Mitigation of Marine Debris in the Gulf of Maine. A report