Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection
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Massachusetts Department of Environmental Protection

Report to the Senate and House of Representatives on water quality at beaches under the care and control of the Department of Conservation and Recreation
Report Appendices

Appendix A: DCR Beach Closure Statistics developed at beach sampling locations from DPH Beaches and Harmful Algal Bloom Databases Memorial Day through Labor Day Weekends 2008 through 2012

MassDEP utilized DPH's database to calculate the percentage of time a given DCR beach's recreational water was "posted" during each beach season, each year for the period of record from 2008 through 2012. Postings lasting for longer than three consecutive days were considered prolonged. This methodology is consistent with the evaluation methodology used by MassDEP for developing the "Integrated List of Waters" report and is described in more detail in the Massachusetts Consolidated Assessment and Listing Methodology (CALM) Guidance Manual (MassDEP 2012). For the purpose of this analysis, hurricane-related (e.g., Bob) and Tropical Storm Irene postings which affected much of Massachusetts in late August and early September 2011, were excluded from the calculations (these severe weather postings were preemptive and not based on bacteria sampling). An analysis was completed for each DCR beach using the number of days the beach was posted (i.e., date posted to date re-opened), summed for each year, and divided by the number of days in that beach season.

Table 1. DCR Beach Closure Statistics for DCR property beaches alphabetically organized by Town and Beach Name. [Note: This table provides a summary of beach closure postings for the swimming seasons 2008 through 2012 as derived from the DPH Beaches Database and these data are presented as the percent of the season closed (season length in days between Memorial Day through Labor Day weekends).]

DCR Beach Closure Statistics – 2008–2012				Sampling year (Season length in days)				
Town	Beach Name	BeachId	SampleLocationId	2008 (98)	2009 (105)	2010 (98)	2011 (98)	2012 (98)
Agawam	Robinson Beach	5183	Sampling Point	2%	0%	2%	10%	2%
Andover	Frye Pond Beach	4759	Sampling Point	7%	5%	9%	2%	0%
Ashby	Damon Pond Beach	4531	Sampling Point	11%	0%	3%	20%	8%
Ashland	Hopkinton Reservoir Upper Beach	4935	Sampling Point	4%	0%	0%	2%	2%
Ashland	Ashland Reservoir Main Beach	4533	Sampling Point	2%	NS	NS	NS	NS
Ashland	Hopkinton Reservoir Main Beach	4934	Sampling Point	4%	2%	4%	7%	4%
Boston	Carson Beach	2647	at I St.	27%	24%	23%	3%	1%
			at Bathhouse	27%	25%	23%	3%	1%
Boston	City Point Beach	2641	Sampling Point	17%	8%	10%	1%	0%
Boston	Constitution Beach	2646	Rec Center	18%	17%	6%	10%	13%
			North site	18%	17%	6%	9%	13%
			Middle	18%	17%	6%	9%	13%
Boston	Lovells Island Beach	2648	Sampling Point	0%	0%	0%	0%	0%
Boston	M Street Beach	2649	Sampling Point	21%	6%	8%	1%	0%
Boston	Malibu Beach	2645	Sampling Point	4%	1%	4%	2%	2%
Boston	Pleasure Bay Beach	2644	Sullivans	NS	NS	NS	NS	1%
			South Flagpole	NS	NS	NS	NS	1%
			Broadway	4%	4%	0%	4%	3%
Boston	Savin Hill Beach	2643	Sampling Point	4%	1%	2%	2%	2%

DCR Beach Closure Statistics - 2008-2012				Sampling year (Season length in days)				
Town	Beach Name	BeachId	SampleLocationId	2008 (98)	2009 (105)	2010 (98)	2011 (98)	2012 (98)
Boston	Spectacle Beach	5384	Sampling Point	0%	0%	0%	0%	0%
Boston	Tenean Beach	2642	Sampling Point	46%	36%	28%	26%	21%
Brewster	Cliff Pond Beach	4572	Sampling Point	0%	45%	1%	0%	47%
Brewster	Cliff Pond Beach DYS	4574	DYS	1%	45%	0%	0%	47%
Brewster	Flax Pond Beach	4573	Sampling Point	0%	0%	0%	0%	0%
Brimfield	Dean Pond Beach	5180	Sampling Point	6%	NS	NS	NS	0%
Charlemont	Cold River Pool Beach	4589	Sampling Point	20%	6%	4%	17%	23%
Chicopee	Chicopee Reservoir Beach	5172	Sampling Point	2%	0%	2%	2%	0%
Clarksburg	Mauserts Pond Beach	4600	Sampling Point	9%	10%	2%	11%	9%
Concord	Walden Pond Red Cross Beach	4605	Sampling Point	0%	0%	3%*	NS	0%
Concord	Walden Pond Main Beach	4604	Sampling Point	3%	0%	3%	2%	0%
Dartmouth	Demarest Lloyd Beach	2733	Sampling Point	1%	0%	0%	0%	0%
Douglas	Wallum Lake Beach	4620	Sampling Point	0%	2%	0%	0%	0%
Edgartown	Joseph Sylvia State Beach	2811		0%	0%	0%	0%	0%
Edgartown	South Beach (Katama)	2800		0%	0%	0%	0%	0%
Erving	Laurel Lake Beach	5357	Sampling Point	2%	0%	0%	0%	0%
Fairhaven	Fort Phoenix Beach	2820	Sampling Point	1%	14%	3%	1%	5%
Framingham	Saxonville Beach	5325	Sampling Point	0%	0%	0%	2%	NS
Gardner	Dunn Pond Beach	5181	Sampling Point	2%	41%	2%	8%	6%
Goshen	Highland Lake DAR Campers Beach	4662	Sampling Point	0%	0%	0%	0%	0%
Goshen	Highland Lake Day Use Beach	4663	Sampling Point	0%	0%	0%	0%	0%
Hubbardston	Comet Pond Beach	4940	Middle	0%	0%	0%	0%	0%

DCR Beach Closure Statistics - 2008-2012				Sampling year (Season length in days)				
Town	Beach Name	BeachId	SampleLocationId	2008 (98)	2009 (105)	2010 (98)	2011 (98)	2012 (98)
Hull	Nantasket Beach	2913	Water St.	2%	0%	0%	0%	0%
			Park St.	2%	0%	0%	0%	0%
			North site	2%	0%	0%	0%	0%
			Bathhouse	2%	0%	0%	0%	0%
Huntington	Westfield River Beach - Huntington	4944	Sampling Point	NS	NS	NS	NS	NS
Lowell	Pawtucket Falls Beach (AKA Rynne Beach)	4702	Sampling Point	0%	0%	2%	0%	NS
Lynn	Kings Beach	2929	Stacy Brook Outlet	49%	24%	17%	43%	10%
			Stacy Brook	NS	NS	NS	45%	10%
			Pierce Road	NS	NS	NS	NS	10%
			Ocean Terrace	28%	24%	17%	38%	NS
			Kimball Road	49%	24%	17%	40%	10%
Lynn	Lynn Beach	2928	Sampling Point	1%	0%	0%	3%	0%
Mashpee	South Cape Beach	2961	Sampling Point 1	0%	0%	0%	0%	0%
Milton	Houghton's Pond Beach	4732	Sampling Point	2%	0%	1%	4%	1%
Monterey	Benedict Pond Beach	4733	Sampling Point	2%	8%	0%	3%	NS
Nahant	Nahant Beach	2989	South site	1%	0%	0%	3%	1%
			Parking section 9	1%	0%	0%	3%	0%
			N. of bathhouse	1%	0%	0%	3%	0%
			Flagpole	1%	0%	0%	3%	1%
Natick	Cochituate State Park Beach	4745	Sampling Point	9%	0%	3%	2%	0%
North Andover	Berry Pond Beach	4758	Sampling Point	3%	NS	NS	NS	NS

DCR Beach Closure Statistics - 2008-2012				Sampling year (Season length in days)				
Town	Beach Name	BeachId	SampleLocationId	2008 (98)	2009 (105)	2010 (98)	2011 (98)	2012 (98)
Otis	Otis Reservoir Beach	4779	Sampling Point	0%	0%	0%	0%	0%
Pittsfield	Lulu Pond Beach	4792	Sampling Point	13%	1%	4%	NS	13%
Plymouth	Barretts Pond Beach	4628	Sampling Point	0%	1%	1%	3%	0%
Plymouth	Charge Pond Beach	4629	Sampling Point	0%	0%	0%	2%	0%
Plymouth	Curlew Pond Beach	4631	Sampling Point	0%	0%	2%	3%	0%
Plymouth	Fearings Pond Beach 1	4632	Fearings Pond Beach 1	0%	0%	1%	2%	0%
Plymouth			Fearings Pond Beach 2	0%	0%	3%	3%	0%
Plymouth	College Pond Beach	4630	Sampling Point	0%	0%	4%	4%	0%
Quincy	Wollaston Beach	3099	Sachem Street	34%	35%	44%	24%	22%
			Rice Road	34%	22%	31%	19%	18%
			Milton Street	33%	36%	38%	22%	17%
			Channing Street	35%	38%	46%	22%	28%
Revere	Revere Beach	3101	Shirley St.	0%	3%	0%	1%	0%
			Point of Pines	0%	3%	0%	1%	0%
			Oak Island St.	0%	3%	0%	1%	0%
			at state police	0%	3%	0%	1%	0%
Revere	Short Beach	3102	Sampling Point	0%	11%	0%	6%	0%
Rutland	Whitehall Pond Beach	4833	Sampling Point	0%	0%	1%	0%	0%
Salisbury	Salisbury Beach	3123	Sampling Point	0%	0%	0%	0%	0%
Sandisfield	York Lake Beach	4834	Sampling Point	2%	0%	0%	6%	2%
Sandwich	Scusset Beach	5163	Sampling Point	1%	1%	1%	0%	0%
Saugus	John A. Pierce Lake Beach	4850	Sampling Point	7%		3%	10%	2%
			Breakheart		3%			
Saugus	Pecham Pond Beach	4851	Sampling Point	6%	1%	1%	18%	26%
Savoy	North Pond Beach	4852	Sampling Point	0%	0%	2%	2%	

DCR Beach Closure Statistics – 2008–2012				Sampling year (Season length in days)				
Town	Beach Name	BeachId	SampleLocationId	2008 (98)	2009 (105)	2010 (98)	2011 (98)	2012 (98)
Savoy	South Pond Beach	4853	Sampling Point	0%	0%	0%	2%	4%
Shutesbury	Lake Wyola Beach	5168	Sampling Point	2%	0%	0%	2%	0%
Springfield	Lake Lorraine Beach	5169	Sampling Point	33%	NS	NS	NS	NS
Spencer	Howe Pond Beach	4869	Sampling Point	NS	NS	NS	NS	NS
Sturbridge	Walker Pond Beach	5186	Sampling Point	9%	0%	2%	2%	2%
Sturbridge	East Brimfield Reservoir Streeter Point Beach	5185	Sampling Point	11%	NS	2%	0%	2%
Taunton	Middle Pond Beach	4906	Sampling Point	1%	NS	NS	NS	NS
Taunton	Watson Pond Beach	4961	Sampling Point	4%	6%	0%	1%	31%
Templeton	Beamans Pond Beach	5170	Sampling Point	10%	0%	0%	5%	0%
Templeton	Beamans Pond Camp Beach	5225	Sampling Point	14%	2%	0%	7%	0%
Townsend	Pearl Hill Beach	4966	Sampling Point	0%	3%	0%	13%	14%
Wayland	Wayland Town Beach	4982	Sampling Point	0%	0%	0%	0%	NS
Wendell	Ruggles Pond Beach	5187	Sampling Point	0%	0%	1%	0%	0%
Westfield	Hampton Ponds Kingsley Beach	5177	Sampling Point	2%	10%	2%	29%	20%
Westfield	Hampton Ponds Lamberts Beach	5178	Sampling Point	2%	2%	2%	0%	2%
Westminster	Crow Hill Pond Beach	5033	Sampling Point	4%	0%	0%	6%	0%
Westport	Horseneck Beach	3203	Sampling Point	0%	1%	3%	0%	0%
Winchendon	Lake Dennison Campers Beach	5182	North Camp	7%	0%	0%	2%	2%
Winchendon	Lake Dennison Day Use Beach		Day Use Area	2%	0%	0%	0%	0%

DCR Beach Closure Statistics – 2008–2012				Sampling year (Season length in days)				
Town	Beach Name	BeachId	SampleLocationId	2008 (98)	2009 (105)	2010 (98)	2011 (98)	2012 (98)
Winchester	Upper Mystic Lake Shannon Beach	5173	West	NS	NS	NS	NS	NS
			Sampling Point	23%	1%	8%	9%	3%
			Middle	NS	NS	NS	NS	NS
Windsor	Westfield River Beach – Windsor	4909	Sampling Point	26%	NS	NS	NS	NS
Winthrop	Winthrop Beach	3217	Sampling Point	0%	4%	0%	2%	0%
Worcester	Lake Quinsigamond Regatta Point Beach	4916	Sampling Point	24%	2%	0%	7%	15%
Worcester	Lake Quinsigamond Lake Park Beach	4915	Sampling Point	32%	0%	10%	5%	4%

* Walden Pond Red Cross Beach only sampled once in 2010

Appendix B: DCR Beach Closure Informational Pamphlet: Why is the beach closed today?

Stormwater Runoff

"Paved surfaces allow rapid runoff of stormwater . . ."

Unlike the porous terrain of forests and wetlands, paved surfaces prevent stormwater from soaking into the ground. Paved surfaces allow rapid runoff of stormwater, which can carry bacteria and other pollutants directly to waterbodies.

Agriculture can also be a source of bacteria if manure is exposed or if livestock drink and graze near waterbodies.

Do...

- Promote "buffer zones" of natural vegetation between waterbodies and areas of stormwater runoff such as lawns, parking lots, roads and livestock areas.
- Provide livestock with a water source far away from waterbodies.

Don't...

- Don't expose manure piles to rainfall and snowmelt.

Contact Information

For more information on beach closures or how you can help keep our lakes and ponds clean, please contact the Massachusetts Department of Conservation and Recreation at:

Department of Conservation and Recreation
Lakes & Ponds Program
251 Causeway Street, Suite 800
Boston, MA 02114-2104
(617) 626-1411
www.mass.gov/lakesandponds

department of Conservation and Recreation

dcr

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Commonwealth of Massachusetts
Mitt Romney, Governor
Kerry Healy, Lt. Governor

Executive Office of Environmental Affairs
Ellen Roy Herzfelder, Secretary

Department of Conservation and Recreation
Stephen R. Pritchard, Acting Commissioner

This brochure was developed by GeoSyntec Consultants

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Why is the Beach Closed Today?

Understanding Pathogens in Our Swimming Beaches

department of Conservation and Recreation

dcr

What are Pathogens?

E.coli bacteria

Pathogens are disease causing microorganisms, including viruses, parasites and bacteria found in the feces of warm-blooded animals such as humans, pets, livestock, and wildlife. At unsafe levels, these pathogens can be transmitted from water to humans, causing diarrhea, abdominal pain, vomiting, fever and other symptoms.

In MA, public beaches are required by law to test weekly for either *E.coli* or *Enterococci* bacteria. These indicator bacteria, found in the intestines of warm-blooded animals, can indicate the presence of harmful pathogens. When elevated levels of these indicator bacteria are detected, the beach is closed and can only re-open if follow-up tests pass.

This brochure describes common sources of pathogens that contribute to beach closures and suggests steps that homeowners and park users can take to help keep our beaches clean and open.

For more information, contact your local Board of Health or the Massachusetts Department of Public Health (www.mass.gov/dph, 617-624-6000).

Common Sources of Pathogens

Pets

Pet waste contains bacteria and nutrients that degrade water quality and can make it unsafe to swim boat, and fish. When exposed to rainfall and snowmelt, pet waste can be washed into our lakes and ponds.

Do...

- Pick up after your pet! Dispose of pet waste in the trash or bury in a 5-inch trench far away from waterbodies.
- Use biodegradable doggie bags to collect pet waste.

Don't...

- Don't leave pet waste on the street, sidewalk, lawn or beach.
- Don't dispose of pet waste by placing in a storm drain.

Humans

Some common ways that human waste can enter waterbodies include:

- Poorly maintained and failing septic systems, which can leak nutrients and bacteria to groundwater and surface waters.
- Illegal wastewater connections to stormdrains that empty into waterbodies, and
- Leaky diapers in the water at swimming beaches

Do...

- Inspect your septic system annually and pump it out at least every two to three years.
- Put a fresh diaper and rubber panties on your infant before entering the water.

Don't...

- Let your infant enter the water with a soiled diaper.

Wildlife

"Feeding waterfowl discourages natural winter migration, can lead to aggressive behavior..."

Like pet waste, waste from wildlife such as waterfowl, beaver and deer contribute bacteria to our lakes and ponds. Geese and ducks tend to concentrate in areas where humans feed them and can become a major source of bacteria.

Do...

- Enjoy wildlife viewing responsibly by allowing wildlife to maintain a healthy, natural diet...keep wildlife wild!

Don't...

- Don't feed waterfowl, including ducks, geese and swans.
  - Bread and snack food is harmful to waterfowl. These foods lack the roughage and nutrients of a natural diet and can lead to malnutrition.
  - Feeding waterfowl discourages natural winter migration, can lead to aggressive behavior, and encourages large resident bird flocks that degrade our parks and beaches with droppings.

Appendix C: DCR Informational Pamphlet: Bacteria Control Guide for Swimming Operations, 2007

MA-DCR

Bacteria Control Guide

for Swimming Operations

department of Conservation and Recreation | dcr

DCR Lakes and Ponds Program
(617) 626-1411

department of Conservation and Recreation | dcr

Introduction

This guidebook is intended for DCR staff managing properties with lakes, ponds and swimming beaches. This guidebook describes common sources of bacteria that contribute to beach closures and suggests steps that DCR park staff can take to help keep our beaches clean and open.

For more information on beach closures or for technical support related to addressing the sources of bacterial contamination discussed in this guidebook, please contact the DCR Lakes and Ponds Program staff at:

DCR Lakes and Ponds Program
(617) 626-1411

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Potential Sources of Harmful Bacteria at Our Beaches

The Problem

Bacteria are disease causing microorganisms found in the feces of warm-blooded animals such as humans, pets, livestock, and wildlife. Public beaches are required to test weekly for bacteria to ensure that the levels are safe for swimming. When elevated levels of bacteria are detected, the beach is immediately closed until safe levels return. At unsafe levels, these bacteria can be transmitted to humans, causing diarrhea, abdominal pain, vomiting, fever and other symptoms

Pets

Pet waste contains bacteria and nutrients that degrade water quality and can make it unsafe to swim. When exposed to rainfall and snowmelt, pet waste can be washed into our lakes and ponds.

Wildlife

As with pet waste, waterfowl, beaver and deer can contribute bacteria to our lakes and ponds. Geese and ducks tend to gather in areas where humans feed them and can become a major source of bacteria.

Humans

Bacteria from human waste can enter waterbodies from several sources, including failing septic systems, illegal wastewater connections to stormdrains, and leaky diapers in the water at swimming beaches.

Stormwater runoff

Unlike the porous terrain of forests and wetlands, paved surfaces prevent stormwater from soaking into the ground. Paved surfaces allow rapid runoff of stormwater, which can carry bacteria and other pollutants directly to waterbodies. Agriculture can be a source of bacteria if manure is exposed to rainfall or if livestock drink and graze near waterbodies.

Keeping Our Beaches Clean and Safe... A Guide for DCR Facility Staff

In order to keep our beaches open and our visitors safe and happy, the steps discussed in the following sections should be implemented.

Beach Maintenance

Daily beach maintenance, including cleanup of waterfowl droppings, is a critical part of any long-term strategy to minimize beach closures due to bacterial contamination.

- Pick up and dispose of waterfowl droppings daily, prior to beach sand raking.
- Cleanup activities are particularly critical prior to rain events to minimize contaminated runoff.
- Cleanup activities should focus on the beach and any other adjacent areas frequented by waterfowl within a minimum of 25 feet from the shoreline.
- Beach raking with mechanical equipment (e.g. tractor with a York Rake attachment) should never be carried out without first picking up waterfowl droppings. If not removed prior to raking, waterfowl droppings become mixed with beach sand and remain a potential source of bacterial loading to the water as well as an aesthetic problem for visitors.

Landscaping/Physical Barriers

Grassy areas adjacent to water are attractive to geese as areas for grazing. As described below, grassy areas within and adjacent to public beaches can easily be modified to make the site less attractive to geese:

- Plant trees and shrubs to create a visual and physical barrier between open water and grassy feeding areas. Native vegetation can also be used to obscure escape routes from predators, making the area feel less safe and less appealing to geese.

Daily Beach Maintenance Checklist

- Assign staff responsible for daily beach cleanup.
- Check weather forecast to ensure that beach cleanup is conducted prior to rain.
- Remove and dispose of all waterfowl droppings on the beach and other areas frequented by waterfowl within 25 feet from the shoreline. Conduct this cleanup prior to beach raking.
- Waterfowl droppings should be properly disposed of or buried in an area that is at least 100 feet away from the pond.
- Make sure all Mutt-Mitt dispensers are fully stocked.
- Clean up any garbage or food that may attract wildlife in beach and adjacent picnic areas

Vegetated Goose Buffers:

Geese prefer grazing in grassy areas that offer unobstructed access from the water. The "goose buffer" shown above was installed at Lake Wyola State Park in 2006. As the shrubs mature, they will provide a visual and physical barrier between the lake and the grassy areas of the state park beach.

Native shrub species planted in the buffer included Silky Dogwood, Red Osier Dogwood, Bayberry, Pussy Willow, Meadowsweet, Wild Raisin, and Northern Arrowood. These shrubs will filter stormwater draining towards the lake, while also providing food and habitat for local wildlife.

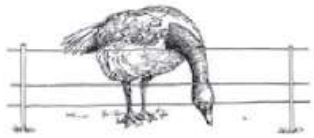
- **Allow grass to grow taller**. Geese do not like to walk through tall grass.
- Reduce grassy areas by planting **ground cover** (e.g., pachysandra) or convert a lawn to a **wild flower** meadow. Geese do not like to eat or walk through such plantings.
- **Remove grass** that has encroached on the beach area and re-surface with three inches of screened, washed beach sand. Where possible, a 20- to 25-foot minimum width for beach sand is recommended.

At Mauserts Pond (Clarksburg State Park), grass encroaching on the beach area was tilled and re-surfaced with three inches of beach sand.

Feeding Deterrents

- Several products are available to deter waterfowl from feeding on grassy areas. ReJex-iT is a non-toxic grape juice derivative that makes grass unpalatable to geese. Grassy areas can be treated with a spray applicator. Repeat applications are required after rain.

- **Fences and other Physical Barriers** can be effective tools to restrict goose movement. In most situations, Canada geese tend to walk, not fly, to and from water to feed. A low fence or other barrier to prevent access may discourage geese from accessing a beach/day-use area.
- **Temporary fencing** can be installed around a beach area (e.g. prior to the summer beach season or after hours) to discourage bird access to adjacent grassy areas for grazing. Sectional "string" fencing systems are designed to discourage waterfowl. These systems use narrow posts and retractable strings, creating minimal visual disruption while discouraging the passage of geese. If needed, this type of fencing could be kept in place from early spring through the end of the summer beach season and used to fence an entire day use area.



String fencing can be an effective deterrent, particularly when geese have flightless goslings or during the molting season.

"Sectional "string" fencing systems are designed to discourage waterfowl."

Scaring Techniques

- **Visual and audio deterrents** are used to make geese feel unsafe at a site, usually through the use of decoys or sounds that mimic the presence of a predator. Although these types of deterrents can be effective, results tend to diminish quickly as geese become accustomed to their presence.

  Visual and audio deterrents work best in combinations with each other and with other deterrents. Visual deterrents include predator decoys (e.g. fox, coyote), kites, Mylar tapes, and balloons. Audio deterrents (e.g. recorded distress calls, predator calls, explosive noises, and propane cannons) are generally not appropriate for a park setting.

Geese become accustomed to predator decoys unless moved frequently.

- **Trained border collies** can be used during the spring to discourage nesting and summer to disrupt the regular feeding patterns of local flocks. Although effective, this technique is expensive and is not likely to be feasible in most parks as an ongoing management strategy.

Waste Prevention: Signage/Mutt-Mitts

Signage and Mutt-Mitt stations should be posted at the beach/day-use areas to (1) discourage park visitors from feeding waterfowl and (2) encourage park visitors to pick up after their pet. The signs and Mutt-Mitt dispensers shown below are available from the MA-DCR Lakes and Ponds Program. Contact DCR staff at (617) 626-1353 for information on obtaining signs and dispensers.

Mutt-Mitt dispensers provide bio-degradable pick-up mitts that park visitors can use to clean up after their dog.

Depredation Permits

In extreme cases where waterfowl droppings pose a persistent threat to public health and safety, a depredation permit may be sought to reduce a goose population by egg addling or shooting outside of the permitted hunting season. The DCR Lakes and Ponds Program has been issued a depredation permit by the U.S. Fish and Wildlife Service for use on DCR properties. For more information regarding use of a depradation permits, contact the DCR Lakes and Ponds Program at (617) 626-1411.

"In extreme cases where waterfowl droppings pose a persistent threat to public health and safety, a depredation permit may be sought..."

Other Beach Management Concerns

In addition to the sources of bacteria that are discussed in this guide, DCR park staff also should report any unusual conditions that may impact water quality to the DCR Lakes and Ponds Program, including the following:

Non-Native Invasive Aquatic Plants

Non-native aquatic plants such as Eurasian milfoil, Fanwort and Water Chestnut can rapidly infest and degrade a waterbody. Report any new or unusual plant sightings to the DCR Lakes and Ponds Program. Contact the Lakes and Ponds Program for staff training and field guides on invasive plant identification. Information is also available at: http://www.mass.gov/dcr/waterSupply/lakepond/invasive_1.htm

Nuisance Algae Blooms

Nuisance algae blooms can reduce water clarity to below the state swimming beach standard of four feet. Blue-green algae blooms can, in some cases, produce toxins that make it unsafe to swim.

Sediment Plumes

Sediment plumes entering a waterbody from a tributary may indicate runoff from land disturbance activities (e.g. construction) that could require stabilization and regulatory action.

Fish Kills

Natural fish kills can occur due to low oxygen levels, most frequently around ice-out time and during long stretches of high temperatures in the summer. Fish kills should be reported to the MA-Division of Fisheries and Wildlife at (508) 389-6300 on Monday through Friday between 8:00 AM and 4:30 PM. After normal business hours or on holidays and weekends, contact the Environmental Law Enforcement's Radio Room at 1-800-632-8075.

Appendix D: Pet Waste Guidelines for Pet Owners

• Pet Waste is Natural

However, efficient drainage systems and roads now make it easy for pet waste to reach beach waters.

Waste left on the ground either passes through storm sewers untreated or washes directly into oceans, lakes, and streams.

Pet waste is unpleasant and can pose health risks when left on beaches or in other recreational areas

To make sure your pet isn't contributing to the problem, always clean up after your pet and deposit waste in an appropriate manner.

Quick Tips

Reuse old bags: grocery, sandwich, newspaper, produce and bread bags to pick up and contain pet waste.

Keep a supply of bags near your dog's leash.

Tie bags onto the leash if you don't have a pocket or pack.

Do More to Protect the Shore

- Always carry a plastic bag to pick up your pet's waste.
- Do not throw pet waste near a storm drain; use a trash can. Pet waste can also be flushed down a toilet, but please don't flush the bag.
- Make sure to dispose of pet waste in a sealed bag so it doesn't spill during trash collection.
- Do not flush pet or wildlife waste from your deck or dock into the water.
- Obey local leash laws and seasonal bans at beaches.

For More Information

Bureau of Environmental Health
MA Department of Public Health
250 Washington Street, 7th fl
Boston, MA 02108

MA Bathing Beaches Project Website:
www.mass.gov/dph/beaches

Phone: 617-624-5757
Fax: 617-624-5777
TTY: 617-624-5286

Revised July 2007

Pet Waste and Bathing Beaches

Guidelines for Pet Owners

This brochure will educate pet owners on environmentally sound waste disposal practices to protect the recreational waters of Massachusetts.

Bureau of Environmental Health
Massachusetts Department of Public Health

Health Risks Possibly Associated with Pet Waste

Pet waste can contain bacteria and parasites, causing infections such as the following:

Campylobacteriosis: A bacterial infection that causes diarrhea in humans.

Giardiasis: A protozoan infection of the small intestine that can cause diarrhea, cramping, fatigue, and weight loss.

Salmonellosis: Symptoms include fever, muscle aches, headache, vomiting, and diarrhea.

Toxocariasis: An animal to human infection that is caused by roundworms found in the intestines of dogs. The parasite can cause vision loss, rash, fever or cough, and is a particular threat to children exposed to parasite eggs in sand and soil.

Why is Pest Waste A Concern?

There are a lot of pets, producing a lot of waste, and while pet waste is not the most significant pollutant, it can contribute to pollution over time.

Why pick up after my dog, won't the tide wash it away?

Dog waste may pose a health threat to swimmers, wildlife, surfers and other dogs. It can pollute the water and lead to beach closures and closure of shellfish beds.

I only have a small dog; it can't really harm the water, can it?

It can be hard to picture how a single dog depositing a small amount of waste can result in water pollution. However, studies have shown that the combined impact of all pets and wildlife within a watershed can be significant when it comes to water quality and human health.

Be Aware

- When animal waste ends up in the water it decomposes, using up oxygen. During summer months, low dissolved oxygen levels harm fish and other aquatic life.
- Beaches and shellfish beds may be closed, if evidence that disease-causing bacteria and viruses might be present is found on routine water testing. Pet waste can be a cause of test results that close beaches and shellfish beds.
- The majority of water pollution comes from small sources – especially at the household level.

Many towns have "pooper scooper" ordinances that require pet owners to pick up and remove fecal matter from public property. Fines can be imposed on those caught violating these laws.

Appendix E: Department of Conservation and Recreation's Rain Related Precautionary Closure Information for Boston Area Beaches

A summary of the rainfall (in inches) induced precautionary (red flag) postings at the Boston area beaches between 2005 -2012 are provided in Table 6.

The written rain related precautionary posting policy of the Massachusetts Department of Conservation and Recreation for the 2013 swimming season at their Boston area beaches follows.

According to Briere (2013), the first written precautionary rainfall posting policy for the MA DCR's Boston area beaches was developed for the 2006 swimming season. MA DCR staff made adjustments over the years based on data analysis provided by MWRA, insights from DPH, Save the Harbor and others. Significant shifts occurred in 2010 through some strong data analysis and again in 2011 with the opening of the MWRA stormwater tunnel project. Since too limited data (primarily weekly) were available to make very good projections for Savin Hill and Malibu beaches, the precautionary rainfall posting thresholds were removed in 2010.

Table 2. Summary of MA DCR's rain-related precautionary postings (in inches of rain) for Boston Area marine beaches 2005 -2012.

DCR Beaches with Precautionary Rainfall Posting Policies	2005	2006	2007	2008	2009	2010	2011	2012
Kings Beach	NA[1]	NA	NA	NA	NA	NA	NA	NA
Constitution Beach	NA	0.5	0.5	0.5	0.5	1	1	1
Carson Beach	NA	0.5	0.5	0.5	0.5	0.5	2	2
City Point Beach	NA	0.5	0.5	0.5	0.5	1	2	2
Pleasure Bay Beach	NA					2	2	2
M Street Beach	NA	0.5	0.5	0.5	0.5	0.5	2	2
Tenean Beach	NA	0.2	0.2	0.2	0.2	0.25	0.25	0.25
Wollaston/Channing	NA	0.2	0.2	0.2	0.2	0.25	0.25	0.25
Wollaston/Sachem	NA	0.2	0.2	0.2	0.2	0.25	0.25	0.25
Wollaston/Milton	NA	0.2	0.2	0.2	0.2	0.5	0.5	0.5
Wollaston/Rice Street	NA	0.2	0.2	0.2	0.2	0.5	0.5	0.5
Malibu Beach	NA	0.5	0.5	0.5	0.5	NA	NA	NA
Savin Hill Beach	NA	0.5	0.5	0.5	0.5	NA	NA	NA
Spectacle Beach	NA	NA	NA	NA	NA	NA	NA	NA
Lovells Island Beach	NA	NA	NA	NA	NA	NA	NA	NA

[1] NA= Not Applicable

Reference

Briere, G. (Gary.Briere@state.ma.us). 2013. *RE: Precautionary Rainfall postings -- a little more info would be good*. Email to Laurie Kennedy, Massachusetts Department of Environmental Protection, Division of Watershed Management, Worcester, MA dated 19 July 2013.

COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF CONSERVATION AND RECREATION

PROCEDURE DIRECTIVE **DATE: 6/14/2013**

SUBJECT: **Rain-Related Precautionary Closure of Boston Area Beaches**

SECTION INDEX:

I. General Policy

It is the policy of the Department of Conservation and Recreation (DCR) to provide the highest quality swimming waters possible. Whereas rainfall has a proven impact on swimming water quality, particularly in the Boston Harbor area, the agency shall conduct a program of rainfall monitoring in partnership with the Massachusetts Water Resources Authority (MWRA), the Boston Water and Sewer Commission (BWSC) and other interested parties to access timely rainfall data to inform agency decisions regarding posting water quality warnings on Boston Harbor Beaches.

II. Procedures:

A. Harbor Beaches in Rainfall Monitoring Program

The following beaches and/or sections of beaches shall be included in the Rainfall Monitoring Program.

Kings Beach@ Eastern Ave., Lynn
Kings Beach@ Pierce St, Lynn
Kings Beach @ Kimball Rd, Lynn
Constitution Beach @ North Site, East Boston
Constitution Beach @ Middle, East Boston
Constitution Beach @ Rec. Center, East Boston
City Point Beach @ Farragut Road, Dorchester
Pleasure Bay @ Broadway, Dorchester
M Street Beach @ M Street, Dorchester

Carson Beach @ I Street, Dorchester
Carson Beach @ Bathhouse, Dorchester
Tenean Beach @ Middle Site, Dorchester
Wollaston Beach @ Milton Road, Quincy
Wollaston Beach @ Channing Street, Quincy
Wollaston Beach @ Sachem Street, Quincy
Wollaston Beach @ Rice Road, Quincy

B. Rainfall Monitoring Sites

The Department shall collect rain data from gauges as close to the impacted beach as possible. Preferred gauge locations for each beach are as follows.

Beach	Rain Gauge	Owner	Distance
Constitution Beach	Charlestown,	BWSC	1.5 Miles
Pleasure Bay& South Boston Beaches	Union Park	BWSC	1 Mile
Tenean Beach	690 Adams St Dorchester	BWSC	.75 Miles
Wollaston Beach	690 Adams St Dorchester	BWSC	2 Miles

C. Standards for Precautionary Posting

Rainfall can have varying degrees of impact on swimming beach waters depending on storm intensity, stormwater infrastructure and its available capacity, watershed characteristics, tides and other factors. While recognizing this complexity, DCR believes the rainfall standards below would be consistently likely to contribute to unhealthy swimming water conditions. Wollaston Beach will be flagged depending on the results of the tests at each testing location. If three of the four beaches have a positive test, all four beaches will be posted with a Red Flag.

Beach	Rain Event	Action
Kings Beach	Discharge of Lynn CSO # 006	Red Flag Precautionary Closure
Constitution Beach	=> **1.0** inches	Red Flag Precautionary Closure
Carson Beach	=> **2.0** inches	Red Flag Precautionary Closure
City Point Beach	=> **2.0** inches	Red Flag Precautionary Closure
Pleasure Bay	=> **2.0** inches	Red Flag Precautionary Closure
M St. Beach	=> **2.0** inches	Red Flag Precautionary Closure
Tenean Beach	=> **.25** inches	Red Flag Precautionary Closure
Wollaston/Channing	=> **.25** inches	Red Flag Precautionary Closure
Wollaston/Sachem	=> **.25** inches	Red Flag Precautionary Closure
Wollaston/Milton St	=> **.5** inches	Red Flag Precautionary Closure
Wollaston/Rice St.	=> **.5** inches	Red Flag Precautionary Closure

D. Notification of Precautionary Posting

Precautionary closures due to rainfall shall be communicated to beach facilities through normal communications channels as established for water quality notifications. Notification to post shall be made within two hours of day time rain events or by 9:00AM for overnight rains. Red beach quality flags and signage stating

Warning:
No Swimming
Swimming May Cause Illness
Water Contains Elevated Bacteria

MDPH requires that signage must be appropriately displayed in conspicuous locations. Flags alone are not satisfactory.

E. Follow up Enterococci Testing

DCR shall collect a water sample as soon as practical to verify the presence of bacteria at the location.

F. Documentation of Precautionary Posting

DCR shall document the date and time of the precautionary posting, the amount of rain and rain gauge location and the results of the follow up enterococci analysis.