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

TABLE OF CONTENTS

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.

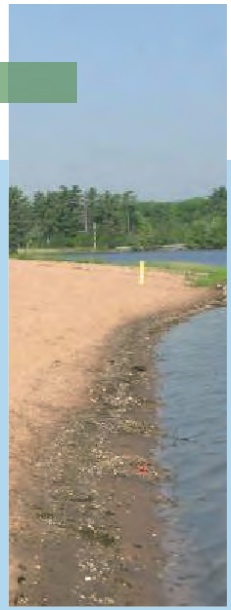
Beach Maintenance

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.

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



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.

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.

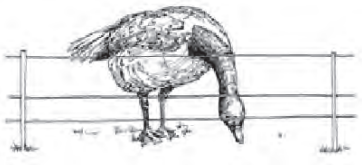
- **Allow grass to grow taller**. Geese do not like to walk through tall grass.
- Reduce grassy areas by planting **ground cover** (e.g., pachysandra) or convert a lawn to a **wild flower** meadow. Geese do not like to eat or walk through such plantings.
- **Remove grass** that has encroached on the 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.