

The Gulls of Massachusetts

Tracking Their Habits



Quabbin and Wachusett Reservoirs, located in central

Massachusetts, are the water supply source for the greater metropolitan Boston area; more than 2 million people rely on these reservoirs for their drinking water. The Department of Conservation and Recreation, Division of Water Supply Protection (the Division) administers a variety of watershed protection programs to maintain and enhance the reservoirs' water quality. The vast resources of water and the surrounding landscape are habitat for a wide array of wildlife, which can pose a risk to water quality when they are:

1. Located in critical areas around reservoir intake structures.
2. Concentrated in numbers that pose a health risk.
3. A combination of both 1 and 2.

An assortment of birds utilize the reservoirs for breeding, migratory stops, roosting, and feeding. Some species (e.g., common loons – see *Downstream #10*) occur in such low numbers that they pose little threat to water quality. Gulls, ducks, and geese, on the other hand, can concentrate in large numbers for an extended period of time. These concentrations can occur seasonally (migrations) or temporally (night-time roosts). Geese and other waterfowl can negatively impact water quality and are considered a priority species to control. Gulls, however, remain the Division's top concern because of their constant presence loafing or roosting, their life history (in particular feeding at landfills), and their documented link to water quality degradation.

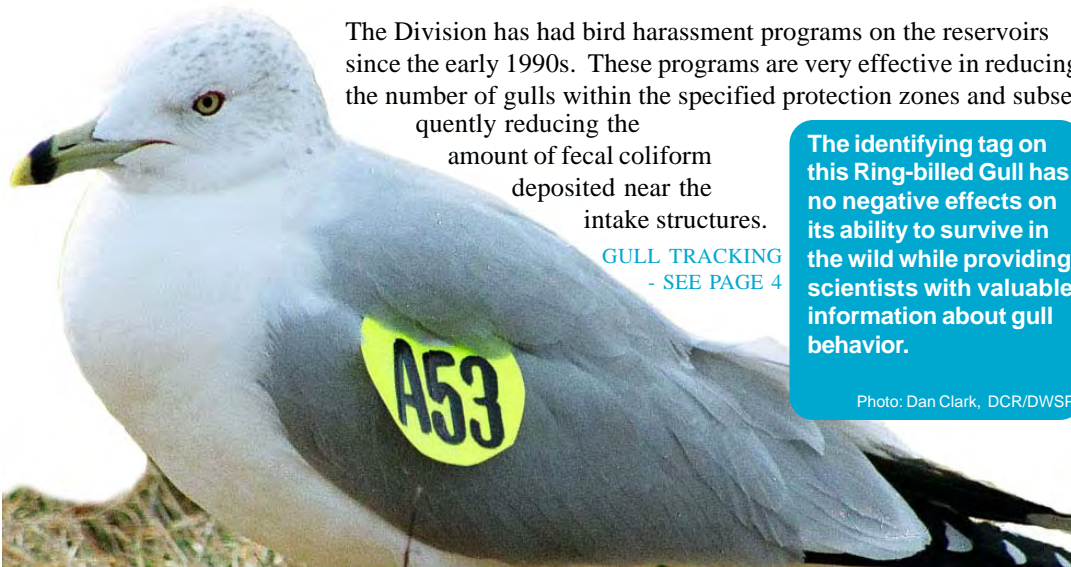
Purpose of the Study

The Division has had bird harassment programs on the reservoirs since the early 1990s. These programs are very effective in reducing the number of gulls within the specified protection zones and subsequently reducing the amount of fecal coliform deposited near the intake structures.

GULL TRACKING
- SEE PAGE 4

The identifying tag on this Ring-billed Gull has no negative effects on its ability to survive in the wild while providing scientists with valuable information about gull behavior.

Photo: Dan Clark, DCR/DWSP



In This Issue:

Gulls have long been known to affect water quality; controlling their presence is a top priority for DCR's Office of Watershed Management. This issue of *Downstream* shares initial findings from a study that is underway to better understand the likes (and dislikes) of the gull population that frequents the DCR reservoir system. There is also important information on the latest potential threat to the Quabbin Reservoir ecosystem.

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Anglers Alert!

Spiny Water Flea is a New Threat

What is spiny water flea?

Spiny water flea (alien species *Bythotrephes longimanus*) is a tiny crustacean related to native forms among Quabbin zooplankton, such as *Daphnia*, but ranges up to about ½ inch in size – over ten times larger than native water fleas! The elongated, barbed tail of this non-native organism protects it against predation by small juvenile fish that have difficulty ingesting the tail spine.

Where did it come from?

Spiny water flea is native to Eurasia and was introduced into the Great Lakes via freighter ballast in the mid-1980s. It was discovered in Great Sacandaga Lake, N.Y., in September 2008, just 108 miles northwest of Quabbin. Currently known U.S. distribution is shown in red on the map below.

Why is spiny water flea a threat to Quabbin fishing?

This non-native organism threatens Quabbin fishing in two ways:

(1) Spiny water fleas compete with juvenile sport fish for food. Both the spiny water flea and young fish prey almost entirely on native water fleas and other zooplankton. Research has shown that spiny water flea predation is capable of reducing the diversity and density of native zooplankton, thus impoverishing the food chain that sustains adult fish.

Spiny water flea, shown in this enlarged photo, is spreading from the Great Lakes eastward, toward the Quabbin Reservoir. Its arrival will pose a threat to water quality and your Quabbin fishing experience.

Photo: MN Dept. of Natural Resources



(2) The barbed tail of this organism catches on fishing gear, especially fishing lines and downrigger cables. Masses of the organism can accumulate as gelatinous, cotton-like clumps, fouling gear, and interfering with fishing (see photo below).

How does spiny water flea spread from one water body to another?

Research has shown that human recreation involving boats is the principle mechanism of transfer of non-native species between water bodies. Boating is an activity that is extremely vulnerable to “hitch-hiking” by non-native organisms because so many surfaces, nooks, and crannies of nautical gear are immersed in water. This is especially true of the spiny water flea because it produces thick-walled “resting” eggs that can remain dormant for long periods of time and are resistant to environmental extremes. These eggs even survive passage through the digestive tracts of fish.

Adult spiny water fleas snagged during boating or fishing may contain resting eggs. These eggs can survive for extended periods after being tangled with downriggers, anchor lines, trailer parts, and fishing gear. Consequently, resting eggs are insidious “stowaways” and contribute greatly to the rapid dispersal of this non-native organism from infested lakes to clean ones. There is no way to eradicate spiny water flea once it is introduced into Quabbin.

What can you do to keep spiny water flea out of Quabbin Reservoir?

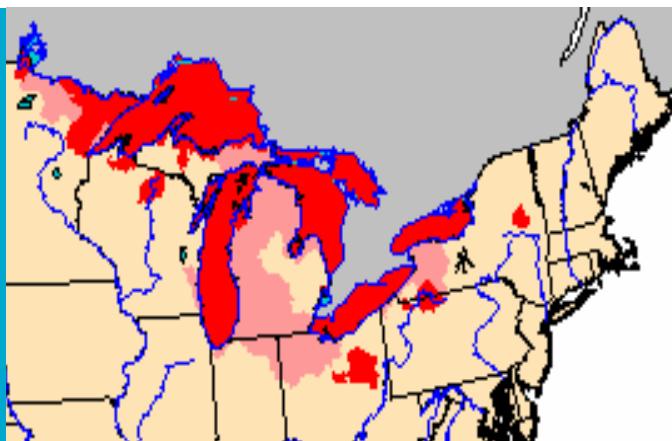
The only hope for excluding spiny water flea from Quabbin is personal vigilance on the part of each and every visiting boater and angler. **This means EVERYONE who fishes at Quabbin!**

If you move your boat among various water bodies, you are the most likely carrier of non-native organisms. The most protective measure boaters can adopt is to dedicate their boat and fishing gear for use exclusively in Quabbin.

If you visit other waters, please scour your boat, trailer, bait buckets, fishing gear, and anything else exposed to outside waters and remove all plant fragments, mud, and debris. Drain water from bilge, engine, and live wells and allow all of the above to dry completely for at least five days before visiting Quabbin.

First discovered in the Great Lakes in the 1980s, Spiny Water Flea was sighted in 2008 at Great Sacandaga Lake in eastern New York state. This species can be an unnoticed hitchhiker to Quabbin on boats and fishing gear.

Map:USGS




Wachusett Reservoir Fishing Line Recycling Update

Last Season's Success, This Season's Prospects



The 2008 fishing season was the second year of recycling monofilament fishing line at the Wachusett Reservoir — it was an even greater success than the fantastic initial year! Approximately 18 miles of line was collected at 10 locations. This program was started because of the large amount of line found along the shore of the reservoir. Fishing line does not readily break down and, therefore, persists in the environment for many years. Birds, animals, and even turtles often get caught in discarded fishing line. An ensnared animal is usually unable to free itself and it dies because of exposure, starvation, or predation. Discarded line has also been found in bird's nests, with dire conse-

quences for the young birds. Collected fishing line is not destined for the landfill; instead, it is recycled into other useful products. By recycling line, it is safely removed from the ecosystem and will unlikely cause harm to wildlife.

This coming fishing season, DCR plans to place five additional canisters in the following locations: Gate 17, Gate WB 33 (Trestle Gate), Stillwater River near John Dee Road, Gate 36, and Canada Mills in Holden. Thanks to everyone who has helped with this very successful program...keep up the good work in 2009! 

- Paula Packard, DCR Aquatic Biologist

Reservoir Watch - MWRA Contract for PCB Remediation of Wachusett Dam Face and Soils

The final phase of the \$5.5 million capital improvements at the Wachusett Dam will remove polychlorinated biphenyl (PCB) contamination from the mortar joints and accumulated efflorescence (crystallized salts that have migrated out from the concrete mortar) on the granite face of the dam. As background, in January 2006 during initial tests for the crest gate construction, it was discovered that concrete joint caulking used in the mid-1960s contained PCBs. PCBs had never been found in the DCR/MWRA water supply; MWRA nevertheless immediately developed and performed (under US EPA guidance and regulatory authority) a detailed water sampling plan in the reservoir and in the water entering the intake. **PCBs were not found in any water sample.**

MWRA subsequently initiated an exhaustive evaluation to assess the presence of PCBs around the dam. A detailed remediation plan was developed once the extent of the problem was characterized. The surface walkway of the dam was recently completed. The

last phase is the remediation of the dam face and soils at the base of the dam.

Work will begin with a pilot test of efflorescence removal methods. The remediation will require an MWRA and EPA approved Work Plan; work is expected to start in early summer 2009. Riggers will set up apparatus across the dam face, and then systematically move up and down to remove the efflorescence and clean the granite and mortar. Granite joints will be repointed as needed; the upper masonry spillway will also be repointed as part of this contract.

After finishing the dam face, several hundred cubic yards of contaminated soil will be removed from the base of the dam. All materials will be secured and hauled to a federally-approved

disposal site. The soil will be replaced with clean loam and seeded to restore the grass cover. The final component of the contract will see the replacement of existing piezometers and observation wells at the base of the Dam. DCR will monitor the piezometers, which are used to ensure dam integrity by measuring pore pressures behind the Dam.

During this final phase of the Dam capital work, the Lower Gatehouse and fountain area will continue to be closed to the public because it is both a construction and hazardous material site. This project is expected to be concluded by fall 2009. Upon completion, the restored grounds will be reopened for public access.

- John Gregoire, MWRA, Program Manager, Reservoir Operations

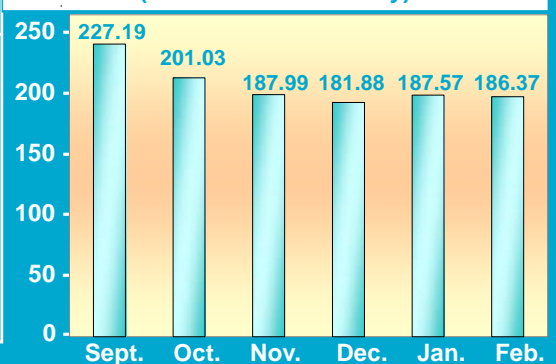
Reservoir Levels and 6-month Precipitation
(September 2008 to February 2009)

Reservoir	Quabbin	Wachusett
Minimum*	527.68'	388.45'
Percent Full	95.6%	86.8%
Date	9/5/08	2/27/09
Maximum*	530.21'	393.89'
Percent Full	100.4%	97.7%
Date	1/11/09	1/1/09
Precipitation	28.37"	22.42"
Seasonal Avg.	23.29"	22.37"

*Reservoir Depth in Feet Above Mean Sea Level

Data provided by MWRA

2009 System-wide 6-Month Water Usage
(Million Gallons Per Day)



The Gulls of the DCR Study



The *ring-billed gull* is the smallest of the three common gulls on the reservoirs. It is characterized by a black circle around the tip of its yellow bill. They are typically 17-21 inches long with a wingspan of 41-46 inches. Adults weigh between .5 - 1.5 pounds (300-700 grams).

Ring-billed gulls are extremely adept at finding and exploiting food resources. They are commonly found in parking lots near malls, restaurants, and department stores where garbage or hand-outs are readily available. In addition, ring-billed gulls can be seen in large recreation fields feeding on worms, agricultural

fields after plowing, near wastewater treatment plants, and, very rarely, in landfills.

Ring-billed gulls are predominately inland nesters. There are currently no known nesting sites in Massachusetts. A small group (< 20 pairs) attempted to establish a nesting colony on an island at Wachusett Reservoir during the summer of 1997. Approximately 10 nests with 16 eggs were discovered on Cunningham Ledge; the colony was quickly controlled, and no further nesting attempts were made. Most breeding currently occurs in the northern maritime provinces of Canada, the Great Lakes, and Lake Champlain.



The *herring gull* is the species often associated with the ocean and the beach. It is a medium to large gull with a yellow bill that has a red dot near the tip of the lower mandible. The wing tips are black with white spots. Herring gulls are 22-26 inches long, with a wingspan of 54-57 inches. They weigh between 1.75 - 2.75 pounds (800 - 1,250 grams).

Herring gulls can be found feeding along beaches and mudflats, in

association with fishing boats, and inland at landfills, sewage treatment plants, and occasionally in parking lots. Herring gulls are one of the most common gulls found at inland landfills.

Historically, herring gulls only nested along the coast on islands with rocky or sandy substrate. They have expanded their nesting range and now also nest inland on roof tops, lakes, rivers, and reservoirs.



The *great black-backed gull* is the largest gull in the world. Although historically found only along the coast and at sea, today they can be seen inland foraging and breeding. It is a large bird with a pure white breast and belly. Its wings and back are a dark sooty black. Black-backed gulls are 28-31 inches long, with a wingspan of 57-63 inches. They weigh between 3 - 4.5 pounds (1,300 - 2,000 grams).

The great black-backed gull has been expanding its historical range southward since the turn of the century. In the 1920s, Nova Scotia was its southern limit. They made it to Massachusetts by 1931, where they were found nesting in Salem. There are several current breeding sites in Massachusetts, all along the coast.

Image source: www.wildbird.com

GULL TRACKING - FROM PAGE 1

Regrettably, they do not address the number of gulls roosting elsewhere on the reservoirs. The harassment programs also do not influence the population of gulls found in central Massachusetts.

Ideally, the Division would like to see the number of gulls roosting on the reservoirs substantially reduced or eliminated. Even though the Division has been focusing on gull harassment for many years, very little is actually known about the life history, movements, or feeding behavior of these birds in Massachusetts. The Division

concluded that in order to achieve a more comprehensive bird control program, it was important to identify other ways to control gull populations, through restricting food sources, understanding roosting behavior, or eliminating roosting gulls from the reservoirs.

The DCR Gull Research program was created to try and find answers to these questions:

1. What and where are the seasonal food resources for each gull species?
2. What are the seasonal movement patterns between feeding and roosting sites, between reservoirs, and between reservoirs and “alternate roosts”?
3. What are the population dynamics of gulls in Massachusetts?
 - a. Where do they nest?
 - b. How do they die?
 - c. What is their lifespan?
4. What are the responses of gulls to various harassment techniques?
 - a. What is the response to full-reservoir harassment?
 - b. What is the response to increased harassment efforts?

Methodology

Gulls have been captured for this study using a variety of techniques, including walk-in traps, Steele’s net, rocket net, and a net launcher. Since the fall of 2008, captures have been done almost exclusively using the net launcher. Bait is placed in front of the launcher, and a net is propelled out and over the birds. The net can effectively and safely capture up to 20 birds at one time.

Once captured, all birds are tagged with a combination of bands and tags. All birds receive both a silver federal band and a color-coded metal band on their legs. In addition, most birds receive individually coded colored wing-tags. These wing-tags are folded over the leading edge of the wing and held in place with a single rivet. The rivet is punched through a loose flap of skin much like getting an ear pierced. The wing-tags do not affect the birds’ ability to fly or survive. A small number of gulls were not fitted with wing-tags; instead they were given a satellite transmitter that was harnessed onto their backs. These solar powered transmitters provide up to six locations per day from anywhere in the world.

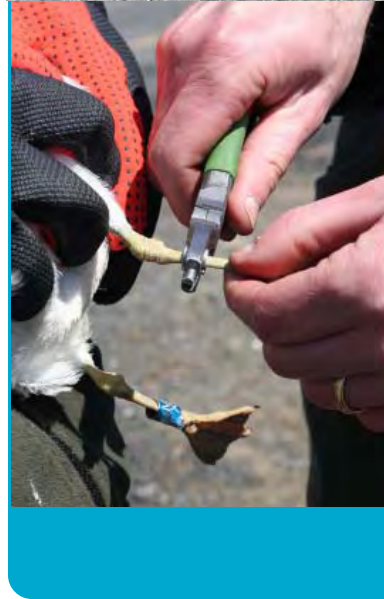
Almost 650 sightings of wing-tagged gulls have been reported to date (see table on page 6).

GULL TRACKING - SEE PAGE 6



These images show the net launcher (top left) used for trapping birds, biologists preparing to capture Gulls (middle right), close work tagging a captured Gull (middle left) and a tagged Gull (bottom), spotted in Maryland, flying freely in the wild.

Photos: Dan Clark, DCR/DWSP



Gull Study Wing Tag Key		
Wachusett Area	dcrc Massachusetts	Quabbin Area

Reservoir. They also have a letter key that identifies the species of gull. If you see a wing-tagged bird, please try to obtain the alpha-numeric combination on the tag (e.g., A57) and report it using the contact information on page six. Please keep a lookout for any wing-tagged birds while birding, grocery shopping, or at

the kids’ soccer games. Common places to find these wintering gull species are at landfills, parking lots, and ball fields. DCR will be happy to provide you with capture information about a specific bird. Reports on the project, when available, will be posted on the DCR website.

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GULL TRACKING - FROM PAGE 5

Gull Study Sightings

Massachusetts	477
Connecticut	63
Rhode Island	19
Maryland	8
New Hampshire	8
New York	16
Pennsylvania	10
New Jersey	10
Newfoundland	6
Maine	4
Virginia	4
Prince Edward Island	3
Quebec	3
North Carolina	3
Labrador	2
Delaware	1
Georgia	1
Manitoba	1
Nova Scotia	1
TOTAL	642

Most of these sightings were recorded by the general public. While a majority of the sightings have been from Massachusetts, study birds have ventured far and wide, having been seen from Georgia to Labrador and Manitoba,

This map shows the adventure of Herring Gull 87433. It was captured on November 5, 2008 at a water treatment plant in central Massachusetts, and then spent the rest of November and much of December near the capture point where it was first tagged. However, on December 20th, this gull abruptly flew some distance out to sea and within three days had flown nearly 1,500 miles to Florida. After the long flight, this gull spent the remaining winter months in a relatively small area on the western side of the Floridian peninsula.

Map courtesy of Google Earth.



Canada. Several gulls that were captured in Massachusetts during the fall of 2008 left the state and were seen in Pennsylvania and New Jersey. These birds have recently started making their way back to Massachusetts and have been spotted in the same locations where they were captured and tagged last year.

The Division was able to deploy satellite transmitters on 7 ring-billed gulls, 10

herring gulls, and 1 great black-back gull. Information received from these transmitters has been a phenomenal success. Some of the larger transmitters were equipped with GPS, allowing accuracy levels within a few meters. Like the wing-tagged gulls, the satellite tagged gulls also displayed tremendous movement out of Massachusetts. Several made their way south to New Jersey and Georgia; two gulls traveled all the way to Florida (see figure above).

SPINY WATER FLEA - FROM PAGE 2

Complete this checklist after visiting any water body:

- ▶ **Inspect** – boat, trailer, and fishing gear
- ▶ **Remove** – plant fragments, mud, debris (hot wash or pressure wash boat/trailer if possible; clean fishing gear)
- ▶ **Drain** – any standing water (bilge, etc.)
- ▶ **Dry** – allow at least 5 days of complete dryness (longer if possible) before visiting a different water body.

The precautions identified in this article help prevent the spread of all non-native aquatic species, including plants (e.g., Eurasian Water-milfoil) and animals (e.g., zebra mussel), as well as spiny water flea. 💧

- Dave Worden, DCR/DWSP Aquatic Biologist

CLEAN and DRY is the only way to keep the spiny water flea at bay, don't transport a stowaway for once in Quabbin it's here to stay!

This image shows how masses of Spiny Water Flea can group together to fowl fishing gear.

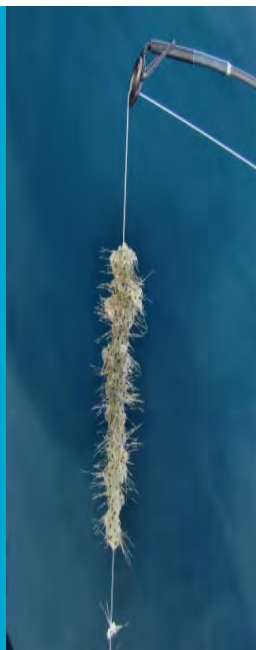


Photo: Jeff Gunderson, Minnesota Sea Grant

The Future

The Division has completed the first full year of work on this three-year study. The field season will wind down in late spring as gulls move out of central Massachusetts toward their breeding grounds along the coast or further inland. Active trapping will commence next fall as gull numbers start to increase in the region. The Division plans to deploy several more satellite transmitters and many more wing tags. The public's help in reporting sightings is always welcome. If you see a wing-tagged gull, please contact: dan.clark@state.ma.us or 508-792-7423 ext. 215 with the date and time of the sighting, the color of the wing-tag, and if possible, the alpha-numeric combination. For more information, go to www.mass.gov/dcr/waterSupply/watershed/study/index.htm. 💧

- Dan Clark, DCR/DWSP Director of Natural Resources

For More Information About Gulls

Check out this book:

Peterson Reference Guide, Gulls of the Americas. Steven N. G. Howell, John Dean. 2007 Houghton Mifflin.

For Birds in General

See these sources:

The Sibley Guide to Birds. David Allen Sibley, 2000 National Audubon Society.

Mass Audubon:
[www.massaudubon.org/
Birds_and_Birding/index.php](http://www.massaudubon.org/Birds_and_Birding/index.php)

National Zoo Bird Page for Kids:
[http://nationalzoo.si.edu/Animals/
Birds/ForKids/default.cfm](http://nationalzoo.si.edu/Animals/Birds/ForKids/default.cfm)

Cornell Lab of Ornithology:
[www.birds.cornell.edu/
AllAboutBirds/](http://www.birds.cornell.edu/AllAboutBirds/)

For More Information About Spiny Water Flea

See these websites:

Aquatic Nuisance Species (ANS) Task Force "Stop Aquatic Hitchhikers" Campaign
www.protectyourwaters.net

United States Geological Survey Nonindigenous Aquatic Species (NAS) Information Resource
<http://nas.er.usgs.gov>

And Another Thing...

by J. Taylor



Well, if red won't do, they are giving out green ones at Quabbin.

Kids Corner



What Is That Bird Doing?

Birds are fascinating creatures with behavior that is often easy to observe. Spring has arrived. The local birds are singing and calling throughout the day, and the migrating birds are feeding, preening, and resting during the day.

You can watch many different types of birds doing a variety of actions by looking out into your yard, taking a walk in your neighborhood, or traveling to public open spaces, like Wachusett Reservoir. Scientists often use lists of bird activities to record what the bird is doing.

Materials you will need: A list of possible bird behaviors (see below), a clipboard or cardboard, and a pencil. Optional materials include binoculars and a bird identification book.

Procedure: Find an area where you can observe a variety of birds. Identifying the bird is not as important as watching what the bird is doing. Once you figure out what a bird is doing, check your list and mark off the behavior you are observing.

Look for a bird on the ground, in the bushes and trees, in the air, or on the water. Check your list carefully to see if you can find an activity that seems to be what the bird is doing. Record it on your list.

If you have the time and interest, you can also try to identify the bird. Binoculars and a bird identification book will make this easier and more fun. The assistance of an adult interested in birds will help with this activity enjoyed by people around the world.

Items you could include on your bird behavior list:

- Singing or calling
- Preening
- Taking a water bath
- Taking a dust bath
- Flying
- Soaring
- Perching in a tree
- Feeding
- Swimming
- Walking or on the ground
- Walking in the water
- Flying with food in its beak
- Building a nest
- Climbing a tree trunk
- Hammering on a tree
- Chasing another bird.

Quabbin and Wachusett, How They Got Their Names

Wachusett and Quabbin are the familiar names of the two drinking water reservoirs cared for by the DCR Division of Water Supply Protection. However, when construction began (1895 and 1926 respectively), they had different titles.

The reservoir to be constructed at the headwaters of the Nashua River by the Metropolitan Water Board (MWB), was initially called the Nashua Reservoir. The MWB changed this name on January 1, 1898, to the Wachusett Reservoir (the dam and aqueduct also got the new name). Wachusett was the name of the area's native inhabitants. DCR Archives staff have found records of 1897 communication between MWB Chairman Henry P. Walcott and the MA Free Public Library Commission (today's MA Board of

Library Commissioners) and also the Massachusetts Historical Society. These two hand-written letters, sent in response to inquiries by the MWB about the possibility of re-naming the Nashua Reservoir, confirmed the literal meaning of "Wachusett" as "by the great hill."

Between 1926 and 1931, the Metropolitan District Water Supply Commission (MDWSC) called the new reservoir being built in the Swift River Valley west of Wachusett the Swift River Reservoir. The largest reservoir in the world at that time was renamed the Quabbin on October 25, 1932. The region had been known as the Quabbin Territory as early as 1736. There is general agreement that Quabbin is a Nipmuk word meaning "meeting of many waters."

Photo: DCR/DWSP Quabbin Visitors Center

A recent discovery in the archival records of the engineer in charge of the Swift River Reservoir construction raises another interpretation. A Nov. 6, 1930, typescript memorandum addressed to Chief Engineer Frank Winsor entitled, "On the Meaning and Derivation of the Indian Word 'Quabbin'," suggests the name is from the Quabog chief "Naniquabbin" – Nani meaning chief and the "in" suffix implying a personal name rather than a place name – who lived in the Swift River Valley around 1700. The memo also questions a 1909 book, *Dictionary of American Indian Place and Proper Names in New England*, that provides the familiar "many waters" meaning. DCR staff will continue to research the validity of this newly found Quabbin definition. 💧

- Sean Fisher, DCR Archivist

DOWNSTREAM

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Downstream is produced twice a year by the Massachusetts Department of Conservation and Recreation, Division of Water Supply Protection. It includes articles of interest to residents of the watershed system communities. Our goal is to inform the public about watershed protection issues and activities, provide a conduit for public input, and promote environmentally responsible land management practices.

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