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Division of Water Supply Protection
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Quabbin Islands

The High Grounds of the Swift River Valley

Clif Read, Director, DCR Quabbin Visitors Center



The most striking physical feature of the Quabbin Reservoir when seen from the air is its sheer size. The 25,000 acres of reservoir surface stretches 18 miles from its southern most point at Winsor Dam in Belchertown to the northern end in New Salem. At its

Baffle Dams connect the 40 acre Walker Island, in the foreground, and Mount Zion, Quabbin Reservoir's largest island at 1,410 acres. The baffle dams and islands redirect the flow of Ware River water brought by viaduct so that it takes up to five years before it is used for drinking water.

widest point, Quabbin Reservoir spans six miles east to west, from Gate 43 in Hardwick to the shores of its West Arm in Pelham.

A closer examination reveals 66 islands dotting the landscape, ranging in size from Mount Zion at 1,410 acres to a number of small unnamed islands less than an acre in size. The total area for all the islands is 3,672 acres, which also adds 63 miles to the reservoir shoreline. Following Mt. Zion, the islands larger than 100 acres in size in descending order are: Mount L, Little Quabbin, Pomeroy, Leveau, Moore, Russ, Curtis, and Liz.

These islands are fascinating features of the former Swift River Valley and carry with them an interesting history. Before the valley was flooded to create the Quabbin Reservoir, the area was characterized by low, flat plains cut by three different branches of the

Swift River. Rising up from the valley floor were the north/south oriented ridges which define the western and eastern edges of the watershed, and the Prescott ridge in the middle of the valley.

There were isolated hills such as Mt. Liz, Mt. Pomeroy, and Curtis Hill; impressive monoliths anchored to the valley floor. Historic photos show these imposing landmarks that oriented both Native Americans and the colonists who followed into the valley.

Quabbin began to fill in 1939, but it took seven years to complete the inundation of the valley. As rising waters crept slowly over the landscape, smaller hills were covered entirely, while the bases of taller peaks were flooded and islands were created. The topographic features we see today are the proverbial tip of the iceberg.

The name Quabbin is a Native American word that was used to describe the Swift River Valley region. Roughly

Water of Champions is Champion of Water

DCR and MWRA water wins regional award By Joel Zimmerman, DCR Regional Planner

Many people may fondly recall the iconic moment in 2011 when the Boston Bruins' injured forward Nathan Horton poured a squeeze bottle of Boston water onto the ice of Vancouver's Rogers Center, helping the team skate to a Stanley Cup championship. Did you know that not only are Boston's sports team championship caliber but so is its drinking water, as it has twice been named "New England's Best."

The New England Water Works Association holds a drinking water contest at its annual conference. Samples from competing New England water utilities were tasted at room



DCR and MWRA staff at Quabbin Reservoir proudly display the New England's Best Drinking Water trophy.

temperature by an impartial panel of judges and scored on a 1-10 scale. The winner of the annual contest, now in its fourth year, receives bragging rights, a large trophy, and the oppor-

tunity to enter the national water taste test in June 2014. This year, for the second time, the source water from the Quabbin and Wachusett Reservoirs, managed by the Department of Conservation and Recreation that is then treated and distributed by the Massachusetts Water Resources Authority, took home the 2013 award for "New England's Best" drinking water.

DCR and MWRA take their championship trophy on a tour, just like the Stanley Cup. The trophy travels to the drinking water supply systems' offices and field locations, visiting all the staff that ensure the quality of this superior drinking water for 2.5 million people. ♀

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Filling the Quabbin Reservoir

The QuabCam Reservoir view on demand

By Ria Convery, MWRA Communications Director



The Massachusetts Water Resources Authority (MWRA) installed a web cam on the windowsill of DCR's Quabbin Visitor Center in 2007 to stream real-time photos of the reservoir from its website, www.mwra.com/qcam.html.

Fred Laskey, MWRA's Executive Director, came up with the idea when the agency was upgrading some of its

security cameras. "It's such a magnificent place, but too far away to visit very often," he said. "So, now you can take a virtual visit whenever you want. I knew we had the technology and thought people would like it."

And like it they do. QuabCam has a fan base that captures still photos and sends in comments. James S., a QuabCam fan and amateur entomolo-

A sampling of images from the QuabCam.

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Photo/Image Credits

- Page 1 *Clif Read*
- Page 2 *Top - DCR*
Bottom - QuabCam
- Page 3 *Top - Kris Keegan*
Bottom - Steve DiStefano
- Page 4 *Top - DCR Files*
Bottom - Clif Read
- Page 5 *DCR Files*
- Page 6 *Top - QuabCam*
Middle - Joe Stafford
Bottom - DCR
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DCR Going Batty

Water Supply Protection Efforts Help Restore the Wachusett Bat Population

By Jillian Pereira, DCR Wildlife Technician, and Allan Rantala, DCR Environmental Analyst



A Little Brown Bat rests on the glove of a DCR Forester, awaiting return to the wild.

Halloween is fading away, but we can still hold faint thoughts of spiders, witches, and, of course, vampire bats! While many people are terrified of bats due to their portrayal as vicious, disease carrying blood suckers, the truth is they are not that scary and actually play a vital role in the local ecosystem.

All bats found in Massachusetts are insectivores, feeding primarily on mosquitoes, moths, and other night-flying insects. They can consume thousands each night and, like most wildlife, they seldom show aggression unless threatened or sick. In addition to eating tons of insects, bats are an important food source to raptors, skunks and raccoons.

Little Brown and Big Brown Bats, two of the most common Massachusetts species, form large nursery colonies during the late spring and summer months. Females roost in dark, hot places such as attics, barns, and other outbuildings to give birth and raise their young. Males, often solitary or in groups less than a dozen in the summer, roost in cooler spots behind window shutters and awnings and under the bark of trees. The bats emerge from their roost sites at sunset to search for food throughout the night.

Bats have excellent eyesight but because they are nocturnal and hunt in the dark, they use echolocation to detect their prey by emitting high frequency sound that bounces back to their ears and enables them to locate their food and other objects.

Most bats in the northeast hibernate using caves and old mines as their hibernacula (winter shelter), mainly in western Massachusetts, upstate New York, and Vermont. Bats that hibernate in caves face the danger of contracting White-nose Syndrome (WNS), a mysterious disease that is devastating bat populations in the Northeast and other parts of the U.S.. Since the discovery of WNS in 2006, the bat population has dwindled 90-100% in some Northeast hibernacula.

Though scientists still do not know the cause of WNS, signs point to a cold-loving fungus called *Geomyces destructans* that gets in the bats' skin. Bats with the disease are often marked with a white powder that covers the nose and other parts of the body. They also exhibit abnormal behavior, such as flying during the day or in the winter when they should be hibernating. The four species in Massachusetts that use hibernacula are the

Little Brown Bat, the Northern Long-eared Bat, Small-footed Bat, and Tri-colored Bat. The Little Brown Bat was once the most abundant species in the state and is now listed as endangered.

In the early spring of 2013, DCR Water Supply Protection staff constructed and installed two designs of bat houses to help the population rebound. Five houses were deployed in three locations around the Wachusett Reservoir. These houses will likely be used by females for rearing pups but may also be used by the males.

In late July, DCR staff surveyed the houses and found that bats were using

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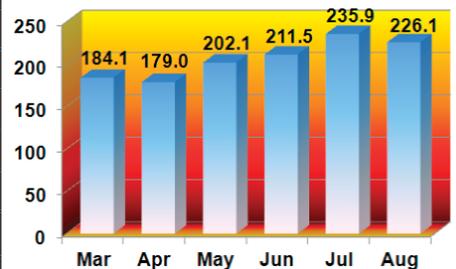
This picture looks up into the open bottom of a popular bat house similar to the ones recently constructed by DCR.

- Reservoir Watch -

Reservoir levels and 6-month precipitation

Reservoir	Quabbin	Wachusett
Minimum	523.5'	389.5'
% Full	87.9%	89.1%
Date	3/1/13	3/28/13
Maximum	528.2'	393.2'
% Full	96.5%	96.3%
Date	7/9/13	6/16/13
Precipitation	29.2"	21.8"
Seasonal Avg	25.2"	23.4"

System-wide 6-month Water Usage (in million gallons per day) March 2013 to August 2013



Data courtesy of MWRA

Islands of the Quabbin From Page 1

translated as “the meeting of many waters” or “a well watered place.” Quabbin was an apt descriptor of the valley, as water was in abundance throughout the area due to the Swift River and numerous ponds, lakes, and streams.

While most of the Native American names for hills were lost over the years, two large hills in what became Greenwich and Enfield were called Big and Little Quabbin. Today, Little Quabbin is an island which covers 397 acres visible from the Enfield Lookout on the north side of Big Quabbin.

The next island to the north is called Mt. Liz, named for Elizabeth Rowlandson, the daughter of a minister who apparently was captured and killed by Native Americans.

A little further north lies Mt. Pomeroy with its graceful bowl shaped peak at the island’s south end and gently sloping northern face. There seems to be less agreement on the origin of the Pomeroy name. One story refers to a great hunter of the region, famous for the large number of bears he killed each year. A competing story has it named for a man burned at the stake by Native Americans.

Other hills were named for local land owners (Chapman, Curtis, and Walker), shapes such as an “L” contour, or natural features (Den).

In addition to serving as landmarks, some of the hills were the focal point for activities for valley residents. For



A historic photograph shows the 1930 motorcycle hill climb held at Little Quabbin Mountain.

many years Little Quabbin Mountain was the site for the annual Motorcycle Hill Climb, attracting hundreds of spectators and participants from miles around. Riders would start from the flat valley bottom just east of the mountain and race their motorcycles up the steep hillside to the top, gaining nearly 500 feet during their ascent.

Curtis Island is the site of the former Dugmar Golf Course, a 1920s speculative land venture by two gentlemen from Springfield. When Thomas Mahar and John Duggan bought the 147 acres of land in Greenwich in 1924, the Swift River Act had not yet passed the Massachusetts Legislature, however it was a foregone conclusion that the Quabbin Project would move forward. They constructed a nine hole golf course in the valley, an area now covered by water. They also built a club house on Curtis Hill, just above the reservoir flow

line at its capacity. Were Mahar and Duggan shrewd speculators or lucky businessmen who parlayed a land purchase into a windfall when they were finally bought out by the state in the 1930s? No matter your opinion, the foundation of the club house is still visible above the water line, evidence of a by-gone era.

The reservoir’s largest island, Mt. Zion, and the smaller Walker Island immediately to the south, are technically not islands due to the baffle dams that create a land bridge to the mainland. From the south end of Mt. Zion, the North Baffle Dam extends 1,615 feet to Walker Island, and then the South Baffle Dam connects to the mainland from the south end of Walker Island.

These two islands and the two baffle dams form a diversion barrier for water entering the reservoir from the Swift River East Branch and from the Ware River. Due to Ware River water’s higher sediment load, nutrient and organic content, the retention time is increased in Quabbin by redirecting the water northward in a counter-clockwise direction around Mt. Zion. This additional distance increases the residence time in Quabbin by nearly five years, allowing greater natural purification and an improvement in water quality.

Den Hill, a moderately sized island of 50 acres, is located just east of the baffle dams. When Quabbin was built



This view from the Enfield lookout is a popular spot with visitors to the Quabbin Reservoir. The main body of land across the water to the far left is the Prescott Peninsula (1) which is connected to land at its far northern end. The islands visible in this view include Mt. Liz (2), Mt. Zion (3), Parker Island (4), and Little Quabbin (5).

part of the western face of Den Hill was excavated, providing rock used on the facing of the baffle dams. The large scar from this excavation is still visible today, rising up from the water line.

The Quabbin's islands have remained undisturbed since they were formed in the 1940s. Public access is prohibited on all the islands. Forest management has not occurred with the exception of a few operations during periods of low water decades ago. Over the years there have been a few natural resource inventories and



A quiet moment on the shores of Russ Mountain, a 141 acres island in Quabbin Reservoir.

research projects conducted on these lands.

Eagles and loons utilize different islands for nest sites, deer and moose swim back and forth to islands, and winter ice provides a bridge for larger wildlife to access the islands, so there is some animal movement from surrounding land. Nevertheless, the islands of Quabbin Reservoir are entities unto themselves, each with their own fascinating history, ecology, and place in the water supply system landscape. ♠

Environmental Reference Points on the Quabbin Islands

by Thom Snowman, DCR Natural Resource Specialist

Natural resource studies frequently make use of “reference” or “control” conditions in places isolated from daily human activities and subjected primarily to natural processes. This data provides important comparisons to conditions brought about by areas more directly affected by human interaction. While no natural area is completely free of human influence, the Quabbin islands are largely inaccessible and have generally been left on their own to cope with natural disturbances, as well as grow without the influence of active forest management. As a result, they are of interest for comparisons to areas more affected by human impacts.

Since 1960, Division of Water Supply Protection (DWSP) Forestry and Natural Resources staff have tracked changes on all watershed forestlands through a Continuous Forest Inventory (CFI). The study established over 350 evenly spaced one-fifth acre inventory plots across the DWSP

watershed properties, including 20 plots spread over 10 islands.

Reassessed every 5-10 years, every tree greater than 5.5” diameter is identified, numbered, measured and its progress tracked. This uncommon data set provides excellent background information on growth and change within our forests.

Forest types on the islands include hardy ridgeline stands of oak, mature northern hardwoods (Ash and Sugar Maple), and tall mature pines on the western and northwestern faces, in particular on Mt. Zion, that escaped the devastating 1938 hurricane. Agricultural practices at the height of farming in New England (mid-1800s) brought the vast majority of water-

shed properties, including what are now islands, into service as tillage, pasture, or woodlot, so that no true “old growth” has been found.

In addition to tracking broad changes in the forests, DWSP also monitors several small populations of rare and endangered plants that have been discovered on the islands. Rare plants have persisted on the islands primarily on very steep or rocky slopes that were not disturbed by early agriculture or logging.

While these populations are now well-protected, even on the islands they are coming under the threat of expanding populations of non-native, invasive species, including Japanese barberry, Asiatic bittersweet, and

common reed. Seed from these species is spread by birds and other wildlife and these invasives, once established, readily occupy areas that are disturbed by natural occurrences such as tree-toppling winds or snow and ice damage. ♠



DCR staff on the beach of Mt. L preparing to assess CFI plots in the 2010 survey. Mt. L is the reservoir's second largest island at 543 acres. It has two CFI plots.

The QuabCam - continued from Page 2

gist from North Carolina, collects stills of the spiders that set up shop in front of the lens – and their victims. Florida retiree ‘Ford21’ writes in from time to time to share cam stills of especially pretty sunsets. He says that he likes to keep the QuabCam on to watch for passing boats, which remind him of his younger days spent fishing in New England.

Kristin MacDougall, who answers

‘Ask MWRA’ questions noted, “For some of our viewers, the sight of boats on the QuabCam can be a cause for suspicion. Over the years, I have received several emails from concerned citizens asking if boats were searching for a body in the reservoir!” She added, “They are always relieved to learn that they are just part of the DCR and MWRA sampling or bird harassment programs. It is good to



know that people across the country are keeping their eyes open.”

The camera takes a live photo every 20 seconds, automatically refreshing in between shots. The footage is not saved, but MWRA posts stills on its Flickr page from time to time. If you have a favorite, send it along to ria.convery@mwra.state.ma.us. 💧

Downspout on the Water

DCR staff member captures rarity By Joel Zimmerman, DCR/DWSP Regional Planner



The tornado downspout over Quabbin Reservoir captured by DCR's Joe Stafford on 9/1/13.

While the QuabCam automatically captures the view looking north from the Quabbin Administration Building in Belchertown, the reservoir is so vast that it still takes the human touch sometimes to see a singular event.

That is what happened on Labor Day weekend, when DCR's Joe Stafford was in the right place at the right time to snap an extraordinary picture. Joe noticed from his vantage point at the Gate 8 Boat Launch Area what appeared to be the tail of a funnel about half way down from the cloud base, and could see the dam and the boat house on the other side.

Once the tail touched down it whipped up enough water that he could

no longer see much on the other side. He grabbed a couple of quick pictures and wondered whether he had just witnessed a tornado.

Joe's pictures were sent along to some weather enthusiasts, who then passed the information to the National Weather Service. Less than a week later, it was confirmed that there was indeed a tornado over Quabbin Reservoir! Meteorologists noted that it is rare to have only one person observe a waterspout and an even more unique feat to have that person take a photo of it, but that is what happened in this case. Fortunately no damage was done by this tornado, but thanks to Joe and his quick actions, we can all see this phenomenon. 💧

Going Batty

- continued from Page 3

each one! It was very encouraging to see them put to use in their first year.

Bat Facts:

- It is estimated that an individual bat can eat 600 insects per hour.
- No U.S. species drinks blood.
- Some bats have existed in their present form for at least 50 million years.
- Bats usually give birth to a single annual litter of one or two that may



This bat house, installed on DCR property, has a two-sided design offering the choice of sunny or shaded sides for roosting and is painted black to ensure maximum heat gain.

weigh up 20% to 30% of the mother's weight. This is comparable to a 100 pound human female giving birth to a 20 to 30 pound baby!

How to help the bat population:

- Stay out of caves and mines where bats are known to roost and abide by cave restrictions and/or closings.
- Report unusual bat behavior to the Massachusetts Department of Fisheries and Wildlife.
- Provide a chemical-free, natural habitat around your home.
- Construct a bat house. 💧

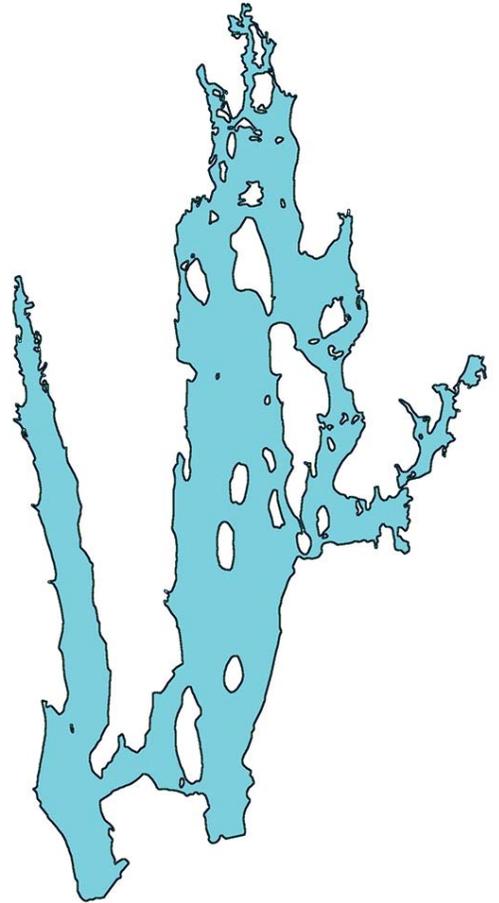
Kids Corner

What's in middle of the Res.?

Fill in the blanks below to complete the list of things found around the edges of the Quabbin Reservoir. Then read the new letters down and find out what is in the reservoir.



Por__upine
 Spi__lway
 Tr__es
 R__ngers
 Shoreli__e
 Stone__alls
 E__gles
 We__lands
 Str__ams
 Dee__



And another thing...

by J. Taylor



The QuabCam captures another tourist visiting the tranquil Quabbin Reservoir, known far and wide for its out of this world drinking water.

For more information about...

Quabbin Reservoir Islands and History
Swift River Valley Historical Society

<http://swiftrivermuseum.org/>

Friends of Quabbin

www.foquabbin.org/

New England's Best Drinking Water

Massachusetts Water Resources Authority

www.mwra.com

New England Water Works Association

www.newwa.org

American Water Works Association

www.awwa.org

Bats

White Nose Syndrome: North America's Response to the Devastating Bat Disease

<http://whitenosesyndrome.org/>

Bat Boxes

www.batconservation.org/bat-houses/build-your-own-bat-house

Then and Now

Filling Quabbin Reservoir

Clif Read, Director, DCR Quabbin Visitors Center



*Looking up Valley From West End of Dike ~ 11 4 39 ~
Photo Pike ~ #2443*

The flooding of the Swift River Valley to create the Quabbin Reservoir commenced on August 14, 1939 and took seven years before the reservoir reached capacity. Two massive impoundment structures hold back the 412 billion gallons of water of the reservoir: the Winsor Dam

blocks the flow of the Swift River and the slightly smaller Goodnough Dike several miles to the east holds back water from the Beaver Brook drainage. The view on the left was taken on November 4, 1939, just above the rotary on the west end of the Goodnough Dike. Looking north over the

low, flat valley and the former land area of Enfield and Greenwich, the image shows a pool of water forming behind the dike, the cleared valley floor and the future islands of Mt. Liz and Mt. Pomeroy. The contemporary photograph shows a full reservoir from the same photo point. 💧

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 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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DCR Commissioner: John P. Murray
DWSP Director: Jonathan L. Yeo
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