Rhode Island
Department of HEALTH

# PROTECT YOUR DRINKING WATER

*Safe and healthy lives in safe and healthy communities*

## The Scituate Reservoir Drinking Water Assessment Results

The Scituate Reservoir supplies drinking water to more than 60 percent of Rhode Island residents and businesses. Owned and managed by the Providence Water Supply Board (PWSB), the reservoir serves the city of Providence, the surrounding metropolitan area, and eight public water suppliers. The main reservoir and treatment works are located in the town of Scituate, but its watershed—the area of land that drains to the reservoir—covers 60,000 acres in Scituate, Foster, and Glocester, with smaller areas in Johnston and Cranston. Within the watershed, residents and businesses rely almost entirely on groundwater to supply public and private wells.

### Key Findings

As a result of proactive watershed management by the PWSB and low-density zoning adopted by Scituate, Foster, and Glocester, the Scituate Reservoir has one of the best protected watersheds in the state.

- Pollution risks are low overall but are magnified on small lots clustered in villages, along shorelines, and in strip commercial zones. Tributaries and groundwater show signs of localized impact from runoff, septic systems, and past waste disposal practices.
- As suburban development increases, threats to water quality from loss of protective forests, polluted runoff, fertilizers, and failing septic systems are also expected to increase. With 80 percent of the watershed land in private hands, actual impacts are highly uncertain and depend on how land owners manage their property.
- Watershed communities can adopt additional protection measures to safeguard groundwater supplies and help ensure the long-term health of the reservoir.

*Fitting a new house into wooded lots with minimal clearing protects private wells, maintains property values, and preserves the rural character that attracts new residents.*

*The Scituate Reservoir Watershed*

### Source Water

The focus of this assessment is on public drinking water supply "source" areas—the *wellhead protection area* that recharges a well or the *watershed* that drains to a surface water reservoir. Source water is untreated water from streams, lakes, reservoirs, or underground aquifers that is used to supply drinking water.

This fact sheet summarizes results of a source water assessment conducted for the PWSB. It identifies known and potential sources of pollution in the Scituate Reservoir watershed and ranks the watershed based on the likelihood of future contamination. The goal of this study is to help water suppliers, local officials, and residents living in drinking water supply areas to take steps to keep water supplies safe.

# Current Land Use & Threats to Water Quality

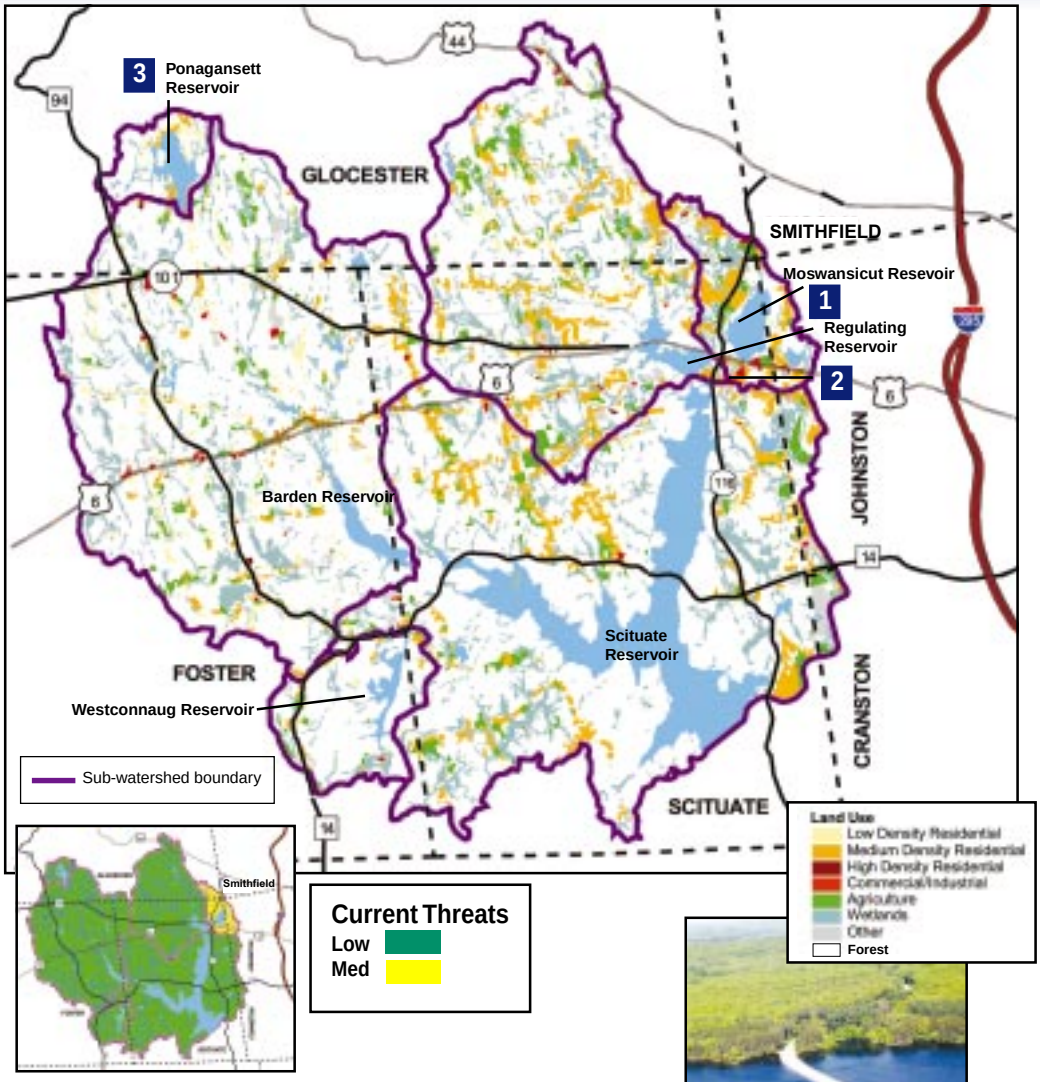
Within a watershed, the quality of groundwater and surface water is directly related to land use activities. To locate high-risk features most likely to affect water quality, the watershed was divided into six smaller reservoirs and their drainage areas, or sub-watersheds. Each sub-watershed was evaluated and ranked using landscape features including: the percentage of pavement and other impervious surfaces, protected shoreline buffers, and estimated nutrient sources such as septic systems and fertilizers. A rating from low to high was assigned to each factor and summed to create an average pollution risk score for each sub-watershed.

## Susceptibility to Contamination


The results show that the vast majority of the Scituate watershed is currently well protected.

- Thirty-five percent of the watershed is permanently protected—most within a critical half-mile zone from the main reservoir.
- Forest covering 66 percent of the watershed helps keep nutrient levels in the reservoir at low, and healthy levels.
- A review of sampling data shows that no regulated contaminants have been detected.

**Note:** A low rating does not mean that the source is free from contamination risk. Without sufficient protection, any water supply can become contaminated. Some contaminants can affect taste, odor, and cost of water treatment at levels below safe drinking water standards.




## Current Threats to Water Quality

Although overall susceptibility to contamination is low, the reservoir is not immune to the effects of development.

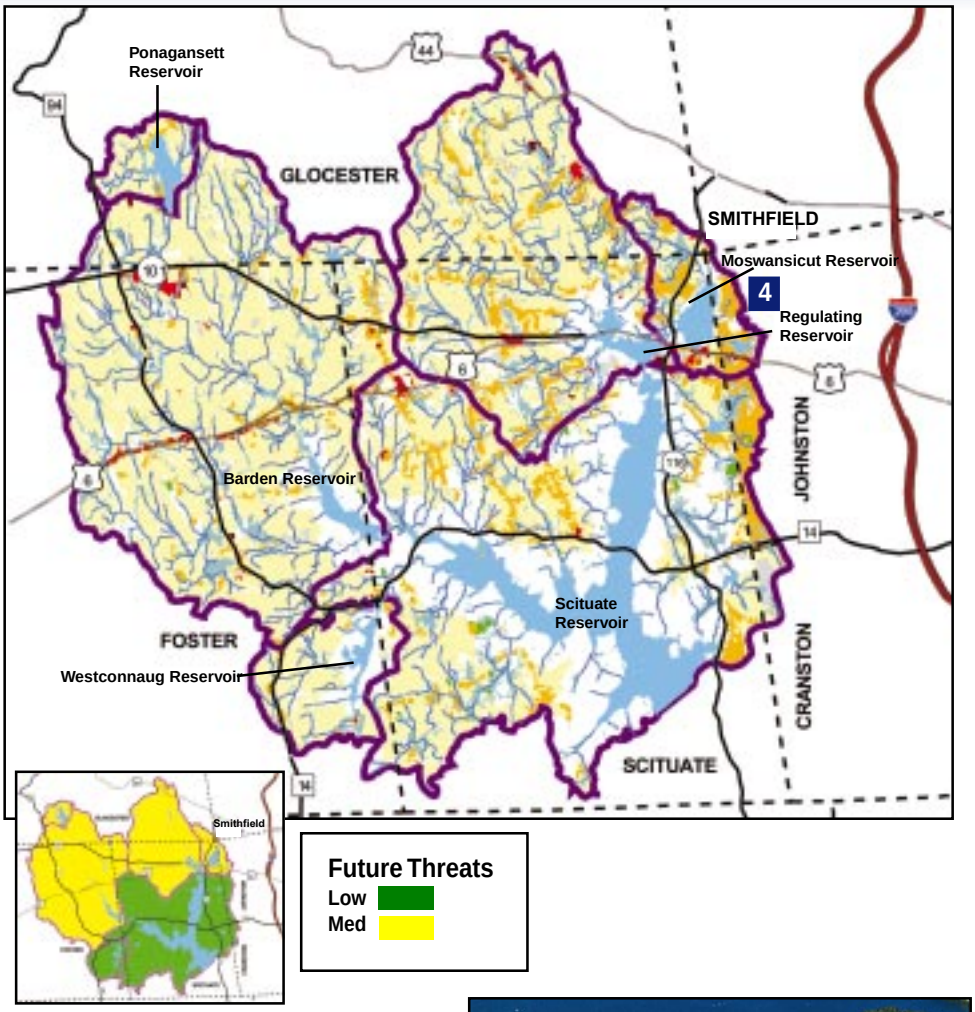
- The Moswansicut and Regulating reservoirs have elevated levels of sediment, nutrients, and bacteria. Mixed commercial and residential development along Route 6 and naturally poor flushing are considered responsible. 1
- Aging septic systems clustered in the North Scituate village increase risk of well-water contamination. Groundwater quality is good overall, but high nitrogen levels in some public wells—a sign of wastewater effluent—underscores the need to maintain and upgrade septic systems. 2
- Homes in shoreline areas, such as those clustered along the Ponagansett Reservoir, increase the risk that bacteria and nutrients from failing or substandard systems will reach surface waters. 3
- Several well-traveled state roads bisect the reservoir, increasing risk of spills and polluted runoff.

*Photos courtesy Providence Water Supply Board*

# Future Land Use & Threats to Water Quality

The shift from forest to mostly low- density residential development is expected to increase pollution risks only slightly. But actual impacts are highly uncertain and may be much greater if landowners develop their properties intensively and if highly marginal wet sites are developed.

- Up to 60 percent of the watershed forest is privately owned and could be converted to homesites. Actual forest loss will depend on the proportion of new subdivisions reserved as open space and whether landowners keep large lots wooded.
- About one-quarter of watershed land is within 200 feet of surface waters or a tributary stream. These naturally vegetated buffers are critical zones protecting watershed health, but most are on private land and unprotected.
- Continued medium-density development in Johnston is likely to increase impervious surfaces to 16 percent, beyond the current 10 percent level which is considered safe for stream quality. 4
- The amount of phosphorus—a key nutrient that overfertilizes fresh waters—is estimated to increase throughout the watershed.
- Commercial zoning covers only a relatively small area but much of the vacant land is on wet soils—up to 70 percent in the Barden Reservoir sub-watershed. Controlling runoff and treating wastewater is more difficult in these areas.




*The vast majority of the Scituate watershed remains forested.*

- Advanced wastewater treatment systems being used to build on highly marginal sites are sure to fail without routine maintenance.
- The amount of nutrients entering groundwater is expected to stay about the same with future development, but septic systems and lawns will become the dominant sources. Overfertilizing and overwatering will result in higher inputs. The increase in number of septic systems underscores the need for proper siting and maintenance to protect wells on small lots and marginal soils.

*Increasing development pressure fragments this forest and associated runoff threatens water quality locally.*

## What You Can Do to Protect Water Quality

### *Local Government and Water Supplier*

***Open space for recreation and water protection***

With 20 percent of the watershed land protected, continued acquisition of land for water supply protection remains a top priority for the PWSB. Since this land is closed to recreation for security reasons, towns could coordinate with the PWSB and nonprofit organizations to develop a regional open space plan for recreation and conservation, with linkages to existing open space.

***Preserving forest***

Using creative subdivision techniques, such as conservation development, can preserve 50 percent or more of developable land as common open space. This low-cost management tool was found to be the single most effective way to preserve large tracts of forest and keep impervious cover and phosphorus inputs closer to present levels.

***Controlling runoff and nutrients***

Nutrient inputs and runoff can be controlled by limiting average impervious area to 10 percent or less with new or expanded development and establishing stormwater standards aimed at keeping runoff volumes at pre-development levels.

***Keeping septic systems functioning***

Foster and Scituate are working together on a joint wastewater management plan that will allow town residents to qualify for low interest loans for septic repairs. Town actions that would best protect local groundwater supplies include regular septic system inspection and maintenance, cesspool phaseout in densely developed areas, and minimum standards for new septic systems on marginal sites.

***Tracking water quality***

The PWSB has an extensive tributary monitoring program. Expanding monitoring to address the nutrient enrichment status of the reservoirs will help track the response of these waterbodies to incoming nutrients and provide early warning of change before the main reservoir is affected.

***Planning and project review***

Large format maps created for the assessement are available at town halls and the water supplier. These are useful in reviewing proposed development projects, town planning, and following up on potential pollution sources.

### *Homeowners*

As more of the land in the Scituate Reservoir is developed, the quality of the reservior will depend on how individual landowners choose to use their land. Pollution risks are minimal with low-density residential development where lots remain primarily wooded. On the other hand, large lawns with heavy fertilizer and water use, conversion of backyards to mini-farms with horses, and encroachment on wetland buffers can multiply impacts several fold.

All septic systems need regular care to function properly, keep wells safe, and avoid costly repairs. Inspect the system annually and pump the tank when needed, usually every three to seven years. Maintain wooded buffers or restore natural vegetation along wetlands or watercourses that run through your property. Reduce fertilizer and pesticide use. Limit watering. For information about protecting your well, contact the University of Rhode Island Cooperative Extension (URI CE) Home*A*Syst Program at (401) 874-5398, www.uri.edu/ce/wq.

### *Farmers and Landowners*

Work with the U.S. Department of Agriculture (USDA) Natural Resource Conservation Service to develop a conservation plan that addresses proper nutrient, manure, pest, and irrigation water management. Contact them at (401) 828-1300, www.ri.nrcs.usda.gov.

### *Commercial and Industrial Businesses*

Adhere to all laws, regulations, and recommended practices for hazardous waste management, above and underground storage tanks, and wastewater discharges. Check local regulations with city/town hall and state regulations with the R.I. Department of Environmental Management, Office of Water Resources (401) 222-4700, www.state.ri.us/DEM/programs/benviron/water/index.htm.

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### For More Information

- **R.I. Department of Health, Office of Drinking Water Quality,** (401) 222-6867, www.HEALTH.ri.gov/environment/dwq/Home.htm
- **URI Cooperative Extension Nonpoint Education for Municipal Officials** (401) 874-2138, www.uri.edu/ce/wq
- **Providence Water Supply Board** (401) 521-6300, www.provwater.com

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