



# PROTECT YOUR DRINKING WATER

*Safe and healthy lives in safe and healthy communities*

## Cumberland, Lincoln, and Pawtucket Drinking Water Assessment Results

### A Shared Resource

The Cumberland, Lincoln, and Pawtucket municipal water supply systems include one surface water supply watershed with five interconnected reservoirs and four wellhead protection areas – all part of the Blackstone River system. Groundwater and surface waters are closely associated as one resource. The water supplies are located primarily within Cumberland but watersheds and recharge areas overlap town and state boundaries, as do water supply service areas.

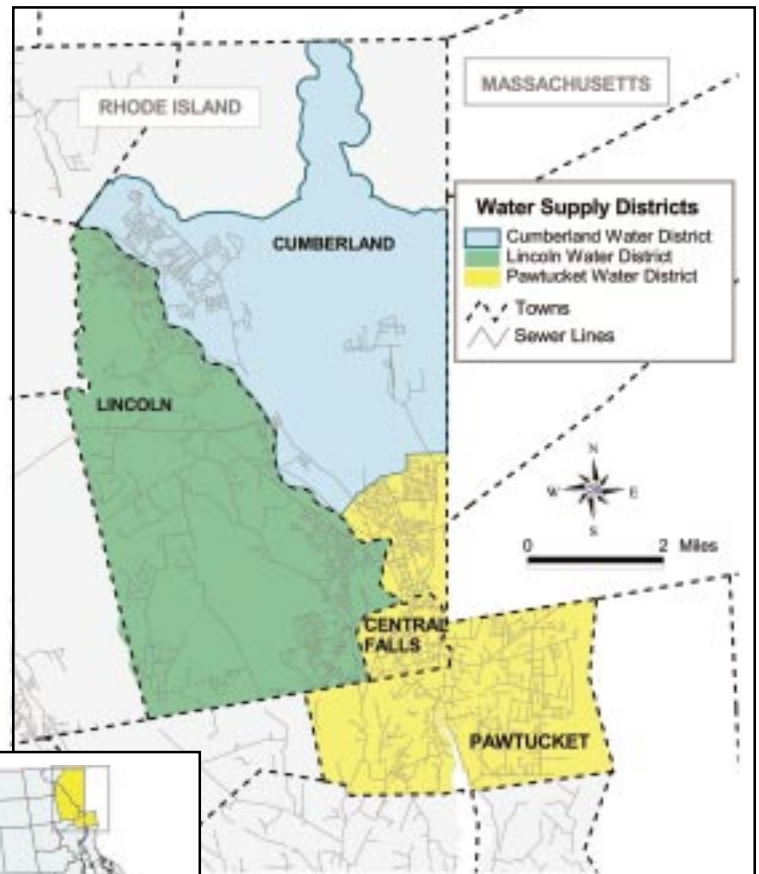
The Pawtucket Water Supply Board (PWSB) serves Pawtucket, Central Falls and the Valley Falls section of Cumberland. The Board also provides water to the Cumberland Water Department. The PWSB manages 97 percent of the Pawtucket /Cumberland reservoir watershed and one overlapping wellhead protection area, all located in Cumberland and Massachusetts.

The Cumberland Water Department (CWD) serves residents and businesses in the public water district beyond the Valley Falls area, about 60 percent of the town. The Cumberland supplies include Sneece Pond, an upper reservoir of the Pawtucket /Cumberland system, and two wellhead protection areas. All supply areas are located in Cumberland except that the Manville wellhead extends into Lincoln.

The Lincoln Water Commission (LWC) owns and operates a single municipal well, located in the Lonsdale wellhead protection area in Lincoln. This is an auxiliary supply for the town during periods of high demand. The majority of residents and businesses in the town purchase their water from the Providence Water Supply Board.



*Arnold Mills Reservoir  
Photo courtesy RI Water Resources Board*



### 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 Cumberland, Lincoln and Pawtucket municipal water supplies. It identifies known and potential sources of pollution in drinking water supplies and ranks their susceptibility to 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.

## Key Findings

The three municipal water suppliers maintain active watershed management programs, helping to ensure water quality through watershed monitoring, stormwater system improvements, and treatment plant upgrades.

- Forested headwaters in the Pawtucket /Cumberland reservoir watershed help maintain downstream water quality. Lower watersheds and wellhead protection areas are highly suburbanized with a greater risk of pollution from dense residential and commercial activities.
- Sampling indicates all drinking water standards are being met but some tributaries are not meeting DEM standards for bacteria and aquatic habitat, partly due to low flow. Increased development will contribute to low flows unless special care is taken to control storm water runoff.
- Water source areas extend beyond communities that use and manage the water supply, requiring a regional approach to watershed management.

## Linking land use to water quality

To locate high-risk features most likely to affect water quality, the Pawtucket /Cumberland reservoir watershed was divided into five smaller reservoirs and their drainage area, or subwatershed. Each subwatershed was evaluated and ranked using landscape features including: the percentage of pavement, protected shoreline buffers, and estimated nutrient sources such as septic systems and fertilizers. A rating from high to low was assigned to each factor and summed to create a pollution risk score for each study area, and an average susceptibility rank for each water supplier.

### Susceptibility to Contamination\*



The results show the Cumberland supplies have a low susceptibility to contamination, while the Pawtucket and Lincoln supplies are moderately susceptible. This is an average ranking for each municipal water supplier based on land use and existing water quality. Individual watersheds and groundwater recharge areas may be more or less susceptible to contamination.

\*NOTE: A low ranking does not mean that the source is free from contamination risk. Without sufficient protection, any water supply can become contaminated. A ranking of moderate means that the water could be contaminated one day. Protection efforts are important to assure continued water quality.

## Land Use & Threats to Water Quality

### Headwater Reservoirs

#### 1 Sneechn, 2 Diamond Hill, and 3 Arnold Mills

The susceptibility to contamination in these upper reservoirs is generally moderate. Forest covering about 60 percent of the watershed, undisturbed stream buffers and low impervious cover all help maintain water quality. The reservoirs are surrounded by public land but forested tributaries – critical zones protecting watershed health – are unprotected and vulnerable to disturbance. In this area of low-density development, septic systems provide an environmentally sound option for wastewater treatment but regular maintenance is needed to avoid failure, especially in shoreline buffers and in areas with poor soils. Most of the headwaters are outside the water service district, where actions taken to protect private wells will also safeguard public supplies and reserve water capacity for more densely developed areas.

- About half of the Diamond Hill and Arnold Mills Reservoir watersheds extend into four Massachusetts communities where local land use controls and state water quality standards may not be designed to protect drinking water quality.
- The Sneechn Pond watershed has the highest proportion of protected land around the reservoir, reducing pollution risks.
- The Diamond Hill watershed has about 10 percent farm land where fertilizers may be used. Thirty percent of the watershed has wet soils with high water table 1.5 –3.5 feet, requiring careful design of storm water controls and septic systems.

### Lower Reservoirs

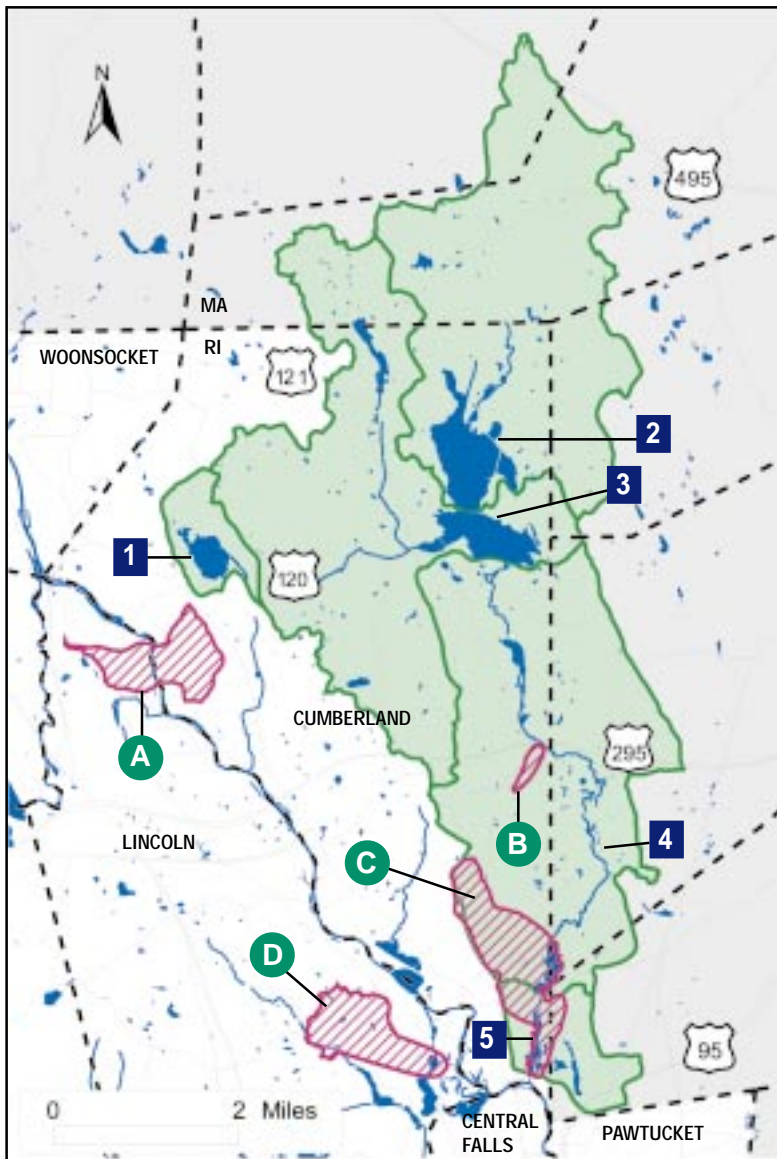
#### 4 Abbott Run and 5 Happy Hollow

These two reservoirs are much more urban than the headwaters and their risk of contamination ranges from high to extreme due to high-intensity land use and disturbed shoreline buffers. With more than 50 percent of each watershed extending into Massachusetts, interstate coordination is essential for ensuring watershed protection.

- All drinking water standards are being met but Abbott Run Brook is not meeting RI fishing and swimming standards due to poor aquatic habitat and metals; Robin Hollow Pond is impaired because of high bacteria levels.



- All surface water in the Pawtucket reservoir system flows to the Happy Hollow Reservoir prior to treatment. This watershed is in the extreme risk category for several land use indicators including: thirty percent impervious cover—a level where water quality impacts are considered very difficult to control; 12 percent commercial and industrial land use, the highest proportion in the surface watersheds; and more than 50 percent of shoreline buffers have been disturbed, reducing natural pollutant treatment potential.



### Pawtucket, Cumberland and Lincoln Major Community Water Supplies

- Pawtucket / Cumberland Reservoir Watershed
- Wellhead protection area
- Town /City boundary
- Subwatershed boundary

### Wellhead Protection Areas

- A **Cumberland -Manville WHPA,**
- B **Cumberland-Abbott Run WHPA,**
- C **PWSB Pawtucket WHPA,**
- D **Lincoln- Lonsdale WHPA**

Most of the wellhead protection areas are highly urbanized, with pollution risks associated with land use features ranging from high to extreme. The Pawtucket wellhead protection area is the most urban, with more than 50 percent of the area in high-density residential with lot sizes of 0.25 acre and smaller.

- Most wells are sited close to surface reservoirs and tributaries, increasing potential for pollutant movement from rivers into wells, and requiring protection of both surface and groundwater resources.
- These areas are largely sewered, reducing risk from septic systems but requiring that sewer systems be monitored for leaks.
- Although commercial and industrial land use comprises only a small percent of land use in the Pawtucket and the Lincoln-Lonsdale wellheads, each has potential sources of pollution where hazardous materials may be used.
- A review of well-sampling data shows that water quality of all wells is still very good. Taking steps to reduce pollution sources as redevelopment and infill occur will help protect the long-term quality of these supplies.



Constructed wetland in the Abbott Run watershed treats stormwater runoff. Photo courtesy RI NRCS

## Protection Opportunities

### Municipal Boards and Government

- Designate a committee to review assessment results, select priorities, and incorporate key recommendations into town plans and ordinances.
- Work with neighboring communities and MA state agencies to implement a regional water supply protection strategy. Coordinate with Phase 2 Stormwater Plans.
- Establish a community pollution prevention education program. Begin with model practices at municipal garages, schools, and parks.

### Headwater Reservoirs—Sneech, Diamond Hill, and Arnold Mills

- Use zoning setbacks for maximum protection of small head water streams and wetlands.
- Set standards to limit site disturbance and control runoff volume.
- Use creative development techniques to preserve forest land.
- Set targets for maximum impervious cover at current levels or no more than 10 percent
- Establish septic system management programs requiring regular inspection and maintenance. Restrict new alternative systems on highly marginal land.
- Apply strict erosion controls. Assign field inspectors in erosive sites.

### Downstream Reservoirs and Wellheads

- Develop standards for redevelopment and infill to limit impervious cover, retrofit stormwater systems, and restore wetland buffers.
- Inspect and maintain sewers to prevent leakage and infiltration.

### Public Water Suppliers

- Implement recommendations in the latest water supply system management plan.

- Continue to acquire land for protection, focusing on intake areas and tributary buffers.
- Work with local officials to implement land use protection measures and education programs.
- Inspect water supply and protection area regularly for potential pollution sources.
- Expand reservoir sampling to monitor nutrient enrichment levels, track frequency and duration of algal blooms.

### Homeowners

Maintain wooded buffers or restore natural vegetation along wetlands or watercourses that run through your property. All septic systems need regular care to function properly, keep your well safe, and avoid costly repairs. Inspect annually and pump tank when needed, usually every 3-7 years. Reduce fertilizer and pesticide use. Limit watering. For information about protecting your well contact URI Home\*S\*Syst (401) 874-5398, [www.uri.edu/ce/wq](http://www.uri.edu/ce/wq)

### Farmers and Landowners

Work with the 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](http://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, wastewater discharges. Check local regulations with city/town hall and state regulations with the RI DEM Office of Water Resources (401) 222-4700, [www.state.ri.us/DEM/program/benviron/water/index.htm](http://www.state.ri.us/DEM/program/benviron/water/index.htm)

This assessment was conducted by the University of Rhode Island Cooperative Extension with funding from the R.I. Department of Health, Source Water Assessment Program, established under the 1996 amendments to the Federal Safe Drinking Water Act.

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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](http://www.HEALTH.ri.gov/environment/dwq/Home.htm)
- **URI Cooperative Extension Nonpoint Education for Municipal Officials** (401) 874-2138, [www.uri.edu/ce/wq](http://www.uri.edu/ce/wq)
- **Pawtucket Water Supply Board** (401) 729-5022, [www.pwsb.org/](http://www.pwsb.org/)
- **Cumberland Water Department** (401) 658-0666, [www.cumberlandri.org](http://www.cumberlandri.org)
- **Lincoln Water Commission** (401) 334-6735 [www.lincolnri.org/](http://www.lincolnri.org/)

Report prepared by URI Cooperative Extension.

Editing and graphic design by Rhode Island Sea Grant (2003).



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