

# Our Drinking Water Supply Lands in New Hampshire

## *How Secure Are They?*



*Did you know that  
critical drinking water  
supply lands:*

- **comprise over 10%  
of New Hampshire**
- **are 4 times more  
developed than the  
state as a whole**
- **are threatened by  
contamination, and**
- **only 12% of the  
critical area has  
been permanently  
protected.**

*Research Highlights from the  
New Hampshire Water Supply  
Land Conservation Project*

Conducted by the  
Society for the Protection of New Hampshire Forests for the  
New Hampshire Department of Environmental Services

*October, 1998*



# *We can't take our clean water for granted.*

Clean drinking water and conservation lands go hand in hand. Natural lands are ideal "pre-treatment plants" for our precious drinking water supplies. Here in New Hampshire, **75% of our population and most of our places of employment rely on public drinking water supplies.**<sup>1</sup>

Decades ago, at a time when watersheds were only sparsely settled, our major cities and villages created reservoirs and river intakes to supply their residents. Fifty two of these surface water supplies are still in use. But, recently our thirst for water has outstripped our surface supplies and we have turned to groundwater. Population has soared from 737,679 in 1970 to 1,173,000 in 1997. Surface water treatment costs have escalated. There are now 679 "community" (residential) public wells and 1459 other types of public wells in the state.

In New Hampshire, we have been **blessed with clean water, in large measure due to our extensive forests and massive investment in waste water treatment.** Today, however, many of the health threats to our drinking water come from dispersed sources: underground storage tanks for petroleum products, pesticides, run-off from pavement and development, landfills, improperly stored or used household, commercial or industrial chemicals, transportation spills, etc. The lands surrounding many of our drinking water supplies are being rapidly encroached upon by development and potentially hazardous land uses. **We can no longer take our drinking water supply lands for granted.**

<sup>1</sup>A public water supply is one which serves 15 connections or 25 people at least two months of the year.

*...What people think of as their water supply*



*The more likely reality...*



# Protecting water at the source.

New Hampshire has made significant progress in protecting its drinking water supplies through education, monitoring, best management practices, land use regulation, and treatment plants. However, these methods alone cannot provide secure protection for our water supplies.

To stimulate more land acquisition, the Department of Environmental Services (DES) entered into a

contract with the Society for the Protection of New Hampshire Forests in June, 1997 to research the feasibility of a public water supply land conservation program for New Hampshire. A program was designed to enable municipalities and water systems to voluntarily acquire land and conservation easements from willing landowners to protect public water sources.



The best way to protect the most **critical** water supply lands for the **longest term** with the **lowest risk** is to buy it. A one time investment in land conservation can save hundreds of thousands of dollars down the road...and provide many other public benefits such as wildlife habitat, recreation trails, and scenic beauty. Yet, in recent decades, land and easement acquisition have seldom been used by public water systems in the state.

Now, Governor

Shaheen has

proposed

legislation that

would initiate

and fund a water

supply land

acquisition

program for

New Hampshire

municipalities and

water suppliers.

Legislation will be

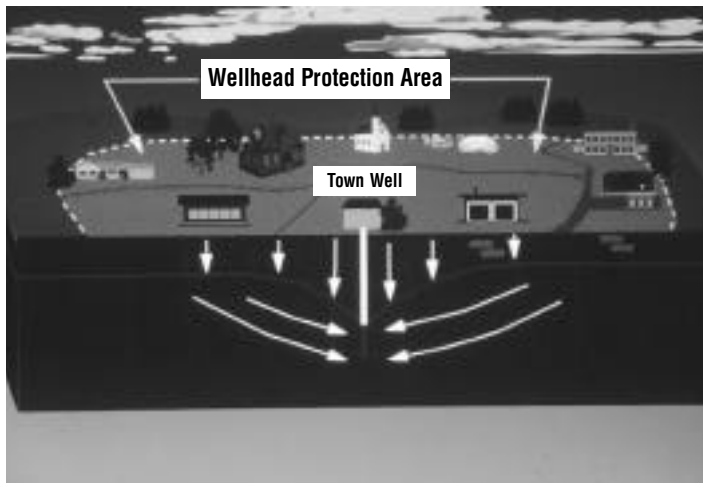
considered by the

1999 session of the

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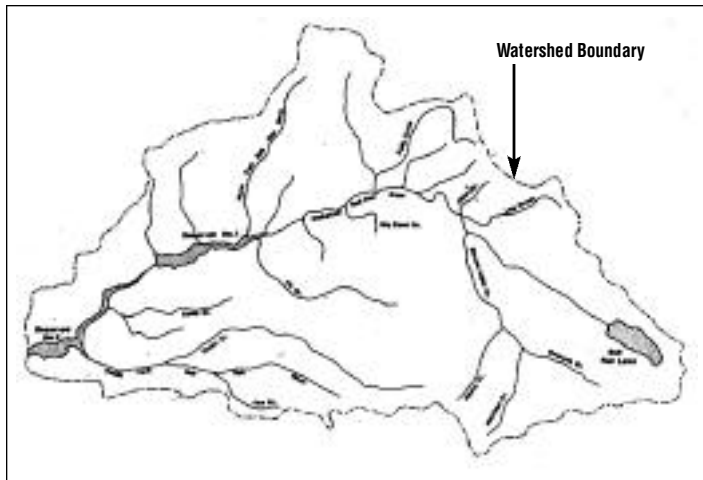
General Court.

# What are our critical water supply lands?



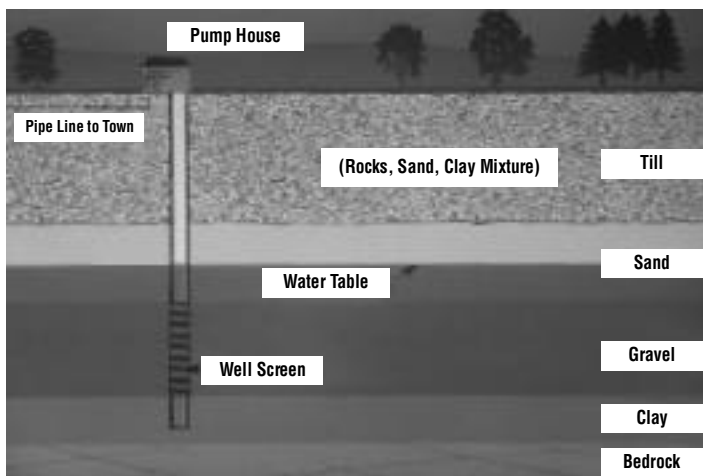
## Wellhead Protection Areas

Land areas which feed water to public wells, also known as wellhead protection areas or source water protection areas (shown in red on the map in the centerfold).



## Watersheds

Watersheds which carry falling rain and melted snow to public reservoirs. Because some watersheds can be so large (for example, the Merrimack River basin!), in this study, critical water supply lands for surface waters were defined as watershed lands within 4000 feet of the intake for the reservoir or river (also shown in red on the centerfold map).

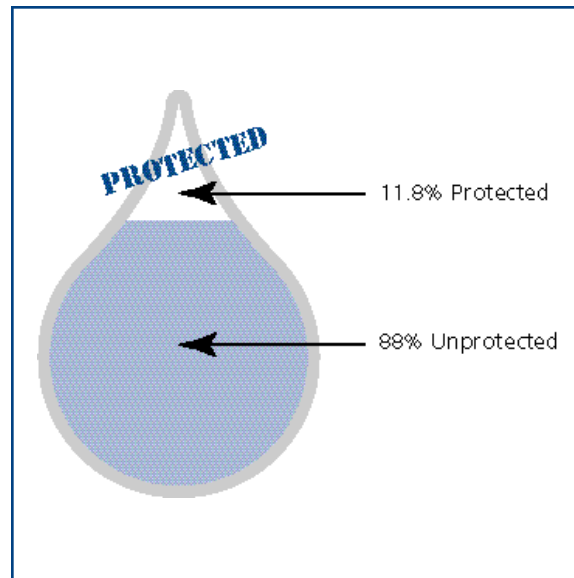


## High-yield Aquifers

High-yield sand and gravel aquifers, those glacial deposits which have a transmissivity of at least 1000 sq. ft./day. These have the greatest potential for future public supplies if they stay undeveloped (shown in blue on centerfold map).

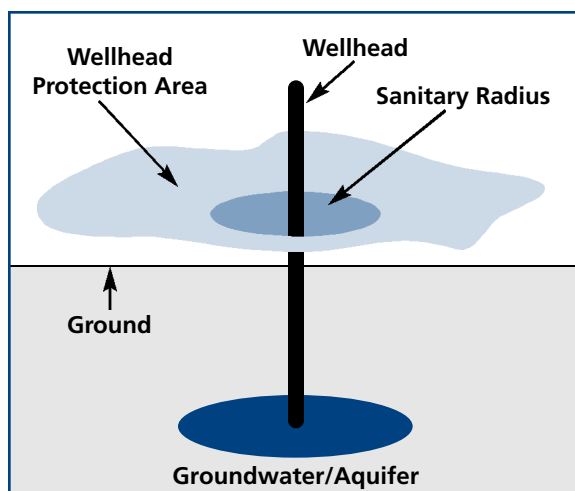
# How much of our critical water supply lands are protected?

Only 11.8% of the state's "critical water supply lands" are protected through ownership or easement. In fact, a given acre of critical water supply land is only half as likely to be conserved as the average acre in the state. The majority (88% of the acreage) of water supply land protection has been accomplished almost incidentally as part of other land conservation initiatives. The surface watersheds are better protected (35%) than "wellhead protection areas" (9%) as a result of land purchases and condemnations 50–100 years ago.



## Doesn't the state require these critical water supply lands to be protected?

No. The only state regulations apply to the area immediately around the well. This area, shown in the diagram, is called the sanitary radius and extends from 150 to 400 feet from the well, depending on pumping rate. The land within this radius is required to be left in its natural state and be under control

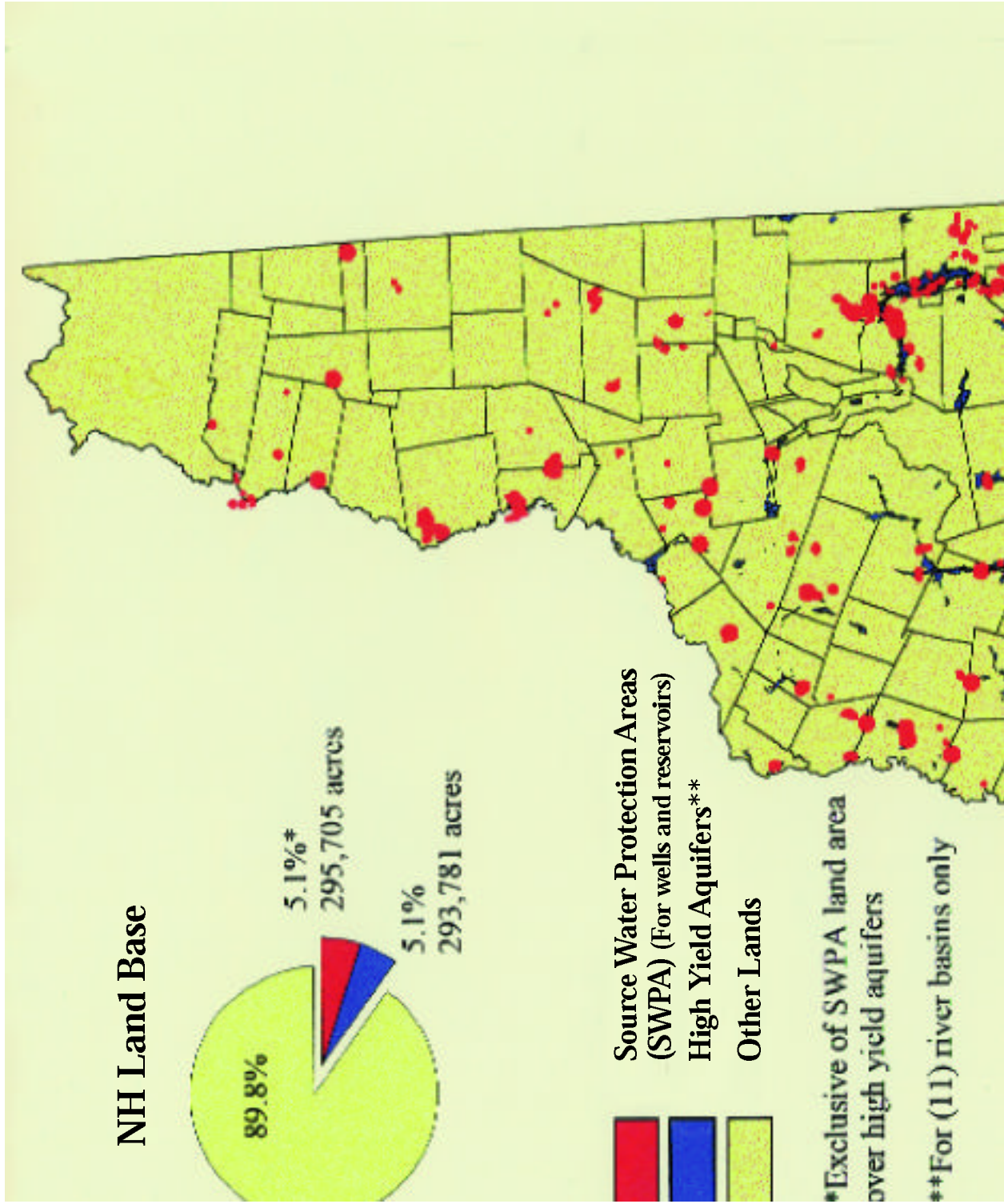


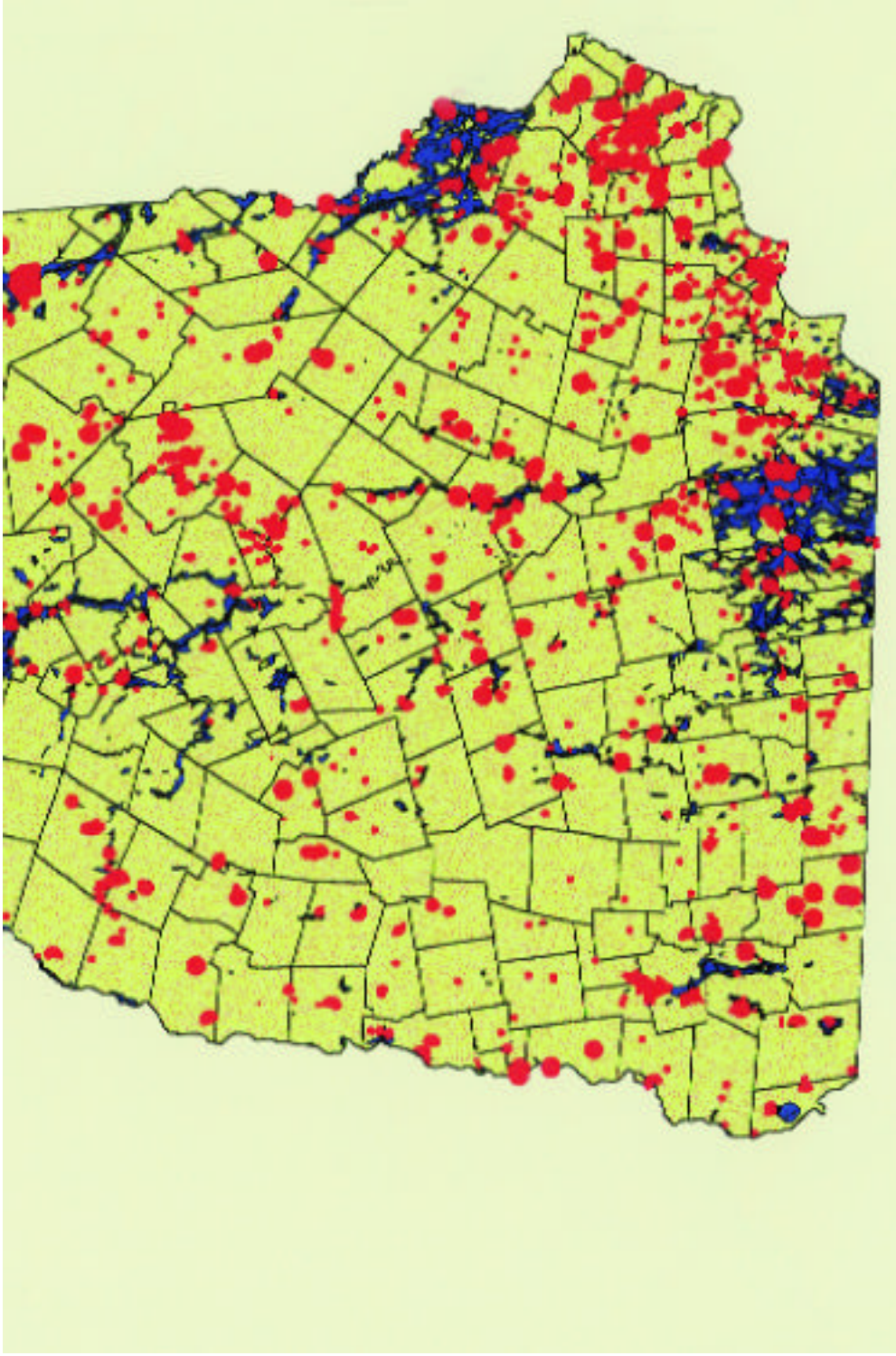
of the water system. Yet, 39% of "community" (i.e. public residential) wells surveyed do not have the sanitary well-radii in the control of the water system.

There are no state regulations that protect the lands beyond the sanitary radius in the wellhead protection area (WPA). The WPA is usually several hundred acres in size, far larger than the sanitary radius. Inappropriate land uses within the WPA can and do contaminate the water supply.

High-yield aquifers, our most promising future water supplies, are not protected by state regulation. Municipal land use ordinances can limit some activities on critical water supply lands and can require best management practices for hazardous substances. To be effective, they must be accompanied by rigorous education, inspection and enforcement programs.

*Look on this map to find the critical water supply lands near you.*





## *New water sources are becoming scarce in many communities.*

- Over 10% of our critical water supply lands are already developed.
- Some towns have built over their best aquifers and must look out for water.
- Approximately 6% of the state is underlain by high yield aquifers (water bearing deposits of sand and gravel), but some areas are well endowed (Ossipee at 21%) and others are not (Newmarket at 1%).

# Critical water supply lands host other valuable natural resources besides drinking water.



## *Wildlife habitat*

Rich aquatic habitat is provided by the more than 50 reservoirs and their tributary streams and wetlands. One fifth of all New Hampshire wildlife depends on wetlands for some phase of their lives.<sup>1</sup> Ten per cent of the state's "high value" wetlands are on critical water supply lands.



## *Rare communities*

Many water supply lands can also function as ecological reserves. Based on NH Natural Heritage Inventory data, 374 occurrences of 145 rare species and 40 exemplary natural communities are located on critical water supply lands — 75% of them on un-conserved lands.



## *Recreation opportunities*

Hikers, hunters and anglers all benefit from the unspoiled habitat provided by water supply lands. Most forms of non-motorized recreation are compatible with water supply lands, with the exception of direct contact with reservoirs.

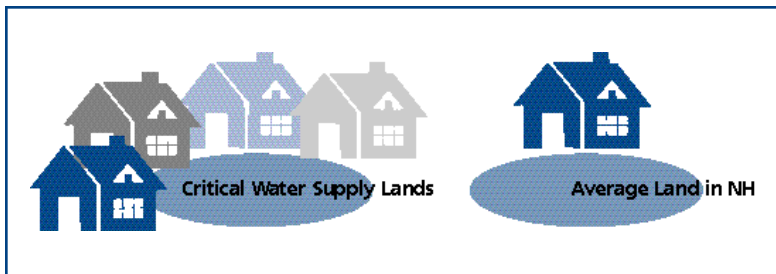


## *Aesthetics*

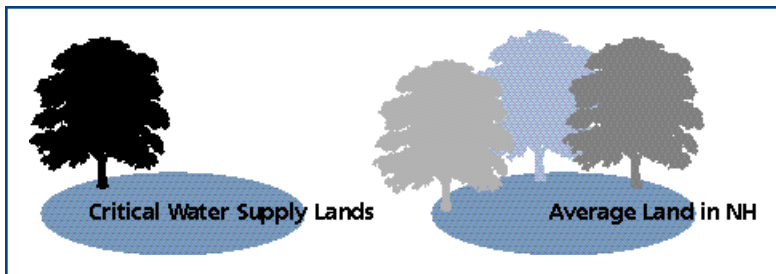
Communities also can benefit from the forest products sensitively harvested from water supply lands. In fact, most reservoir watersheds are managed by foresters to **improve** water quality. With adequate buffers from surface waters and wells, agriculture can also be practiced safely on water supply lands. All of these lands offer scenic beauty and rural character to their communities.

<sup>1</sup>*Buffers for Wetlands and Surface Waters: A Guidebook for NH Municipalities*, ASNH, UNH Cooperative Extension, Natural Resource Conservation Service, NH Office of State Planning, November, 1995.

# What are the threats to our critical water supply lands?



Critical water supply lands are four times as developed, support twice as many roads, and are 25% less forested than the state as a whole.



## Critical water supply lands are threatened by contamination.

- 977 known contamination sources and 427 potential sources are located on critical water supply lands
- 36% of the 1433 “source water protection areas” in the state contain one or more potential or known source of contamination, another 8% contain at least one potential or known “contamination area”
- since 1988 there have been at least 269 detections of contamination in public water supply wells, **67% of these believed to be from human sources**

### Cost of Contamination in Public Water Systems, Case Studies in NH

| Water system                   | Contaminant | Cost of Clean-up |
|--------------------------------|-------------|------------------|
| Seabrook, Well #1              | VOCs*       | \$500,000+       |
| Merrimack Well #6              | VOCs        | \$1,000,000+     |
| Milford Savage and Keyes Wells | VOCs        | \$26,000,000     |
| Peterborough South Well        | VOCs        | \$16,500,000+    |
| Grantham Village School        | Tolulene    | \$4200/year      |
| Londonderry South School       | Nitrate     | \$6700+          |
| Belmont                        | VOC         | \$5000/year      |
| Barrington                     | VOC         | \$45,000         |
| Franklin                       | VOC         | \$40,000         |

Costs for the more serious occurrences of contamination in public water supplies in New Hampshire are shown in the table at left.

\* VOC = Volatile Organic Compounds, typically petroleum or solvents.

# Recommendations for the State

- We recommend that the State of New Hampshire create a *Water Supply Land Conservation Program* to increase the level of protection for public drinking water supplies. The program would assist interested water systems and municipalities with the acquisition of land or easements around their existing and future public drinking water sources. In a survey undertaken as part of this study, 48% of water systems responding indicated an interest in a state program that would help them acquire their critical water supply lands.
- An investment of \$75 million over 10 years is recommended to double the amount of protected water supply land in the state.
- To leverage the state funds, 50% matching grants could be made to water systems and municipalities, which could match state funds with donated land value, municipal appropriations, water revenue, etc.
- The program would be voluntary — for both the landowners from whom land and easements would be acquired, and water systems and municipalities who would apply for the funds.
- A stewardship endowment should be created to make sure that the protected lands remain in conservation use and to assist municipalities and other landowners with stewardship questions.
- Acquisition of drinking water supply lands should be a recommendation of Land and Community Heritage Commission.

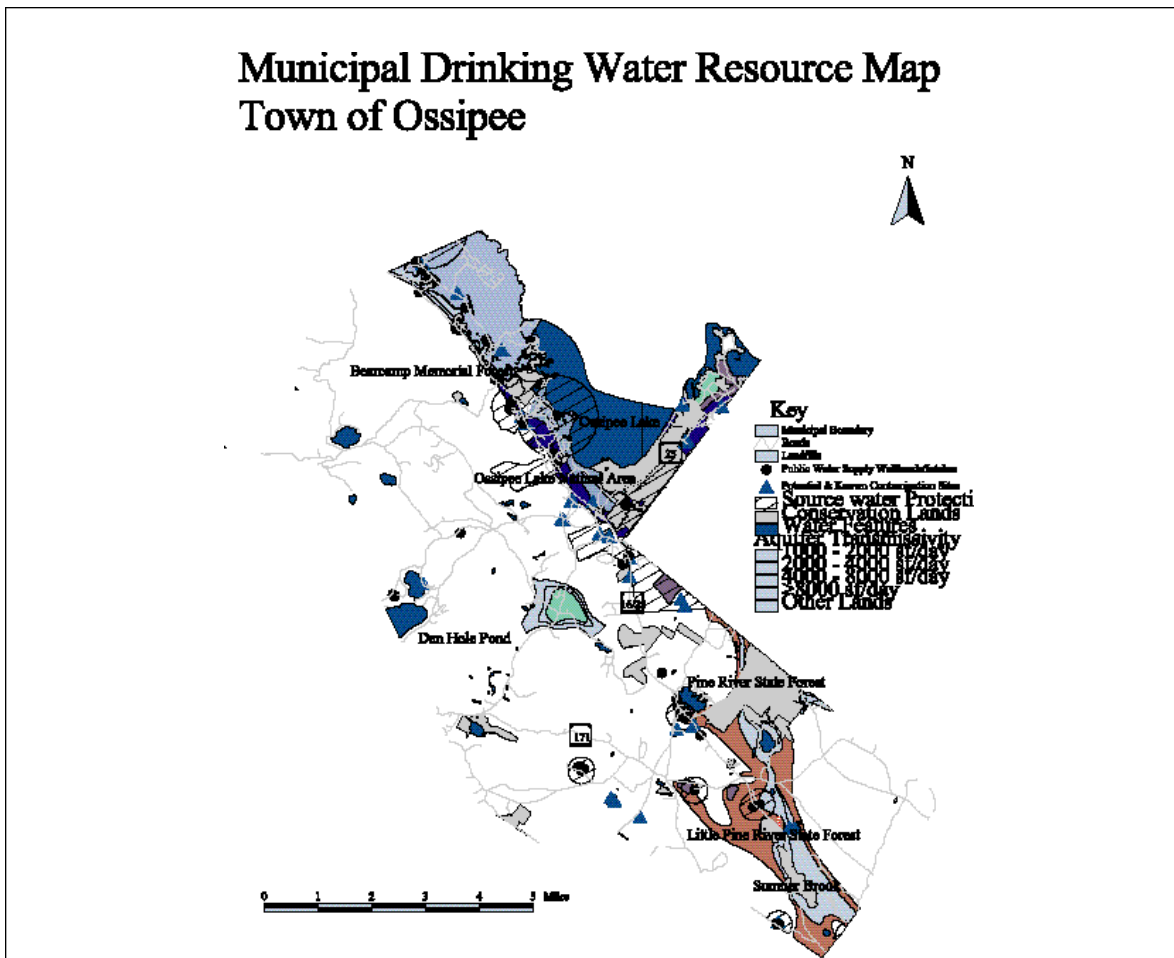


## *Protect our future*

In a recent poll, New Hampshire residents rated drinking water supply lands as the highest priority for acquisition by a state-funded grant program.<sup>1</sup>

<sup>1</sup> Poll commissioned by NH Land and Community Heritage Commission, conducted September, 1998 by UNH Survey Center.

# How can you help?



Use a municipal drinking water resource map for your community, available from DES, such as the example for Ossipee, above. Form a partnership in your community between conservation, water supply and recreation interests. Together, you can answer these questions:

- Where are your water supply lands?
- How well protected are they?
- Do you have local land use regulations in place to help protect these water sources?
- What important natural resources are associated with your water supply lands?
- Where are the contamination sites, roads and development in relation to your critical water supply lands?
- Where will your community get its water in the future?
- Will this land remain undeveloped and available to supply clean water when you need it?
- Which landowners could you approach to discuss land conservation?
- What sources of funding are available to help conserve these lands?

For assistance, call SPNHF's Water Supply Land Conservation Program at 224-9945.

The US Environmental Protection Agency has provided funding for the research project through the Safe Drinking Water Act. The key findings of this research are contained in this booklet.  
For the complete report, *Recommended Water Supply Land Conservation Program for New Hampshire*, send \$10 to SPNHF at address below.



Society for the Protection of  
New Hampshire Forests

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