Water Supply Land Grant Program

Third Report

June 2005 – May 2008

Prepared by the New Hampshire Department of Environmental Services
in accordance with RSA 486-A:9, II

June 2008

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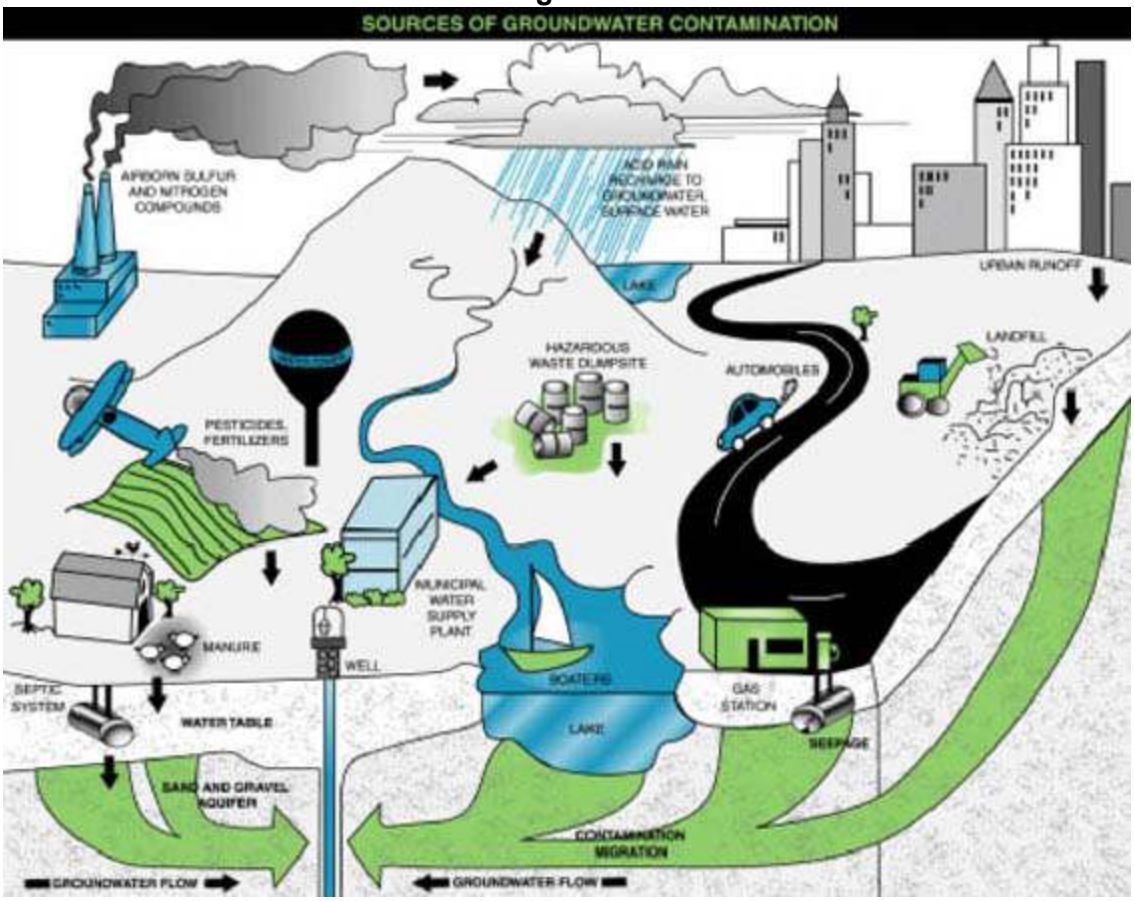
A. INTRODUCTION

New Hampshire continues to be the fastest growing state in the Northeast, presenting a challenge to municipalities responsible for supplying high quality, safe drinking water to their residents. The challenge is to maintain high-quality water supply sources in a changing landscape. Industrial, commercial, and residential development all have the potential to degrade drinking water quality. Rainwater flows across roadways, driveways, roof tops, lawns, and parking lots, gathering contaminants such as motor oil, gasoline, pesticides, fertilizers, and road salt before the water infiltrates into the ground or flows into surface water. In contrast, a natural landscape, particularly when forested, filters and slows down water before it reaches surface water and groundwater. Forests not only filter water but release it more gradually than developed surfaces, so that forested land surrounding a drinking water source preserves not only the quality of the water, but quantity as well.

Figure 1 below shows the relationship between sources of contamination and groundwater sources of drinking water.

Figure 1



Source: http://cis.stclaircounty.org/planningeduc0054.asp

Keeping water supply lands in an undeveloped state is an integral part of water supply protection. The multiple-barrier approach to water supply protection, adopted by the U.S. Environmental Protection Agency and the water supply industry, encompasses a range of strategies, from selecting the best available water sources and protecting them from contamination, to measures that focus on the treatment, monitoring, and distribution of water. Under this framework, these multiple barriers work together to help ensure a safe supply of drinking water. No single aspect of water supply management, such as treatment, should be relied upon to the exclusion of other elements such as source protection.

Water suppliers have practiced source water protection for centuries, if not longer. As early as 1610, the Governor of Virginia issued a proclamation prohibiting various activities within ¼ mile of the fort at Jamestown in order to protect the settlement's water supply wells.[1] Today, source water protection strategies range from land conservation to zoning-based restrictions on land use to programs that seek to ensure the implementation of best management practices where hazardous substances are used.

Some communities, typically larger cities with old water systems, have long practiced source water protection by purchasing land around their drinking water intakes - this has been most often used in protecting surface water supplies rather than wells. For example, Manchester Water Works has used Lake Massabesic as its water supply source since 1874 and now owns 8,000 acres of land, including 95% of the Lake's 28-mile shoreline.[2] The City of New York, which has drawn its water supply from watersheds at least 40 to 100 miles away since 1842, committed $250 million for land conservation over a recent ten-year period.[3] The Commonwealth of Massachusetts owns or controls nearly 29,000 acres (57%) of the vast Quabbin Reservoir watershed, which came on line as a water supply source for metropolitan Boston in 1948.[4]

Purchasing land or placing conservation easements on critical water supply land, over which water flows towards surface water and groundwater drinking water sources, is by far the most effective way to protect drinking water by preserving forested buffers. A conservation easement is a legally binding agreement that limits certain types of activities and development from taking place on the land. A 2002 study by the Trust for Public Land and the American Water Works Association looked at 27 surface water supplies and found that for every 10 percent increase in forest cover in the drinking water source area, treatment and chemical costs decreased approximately 20 percent.[5]

Despite the importance of protecting natural forest land buffers, a 1998 study prepared by the Society for the Protection of New Hampshire Forests (SPNHF) for the N.H. Department of Environmental Services found that in New Hampshire, only 11 percent of the lands through which water flows to sources of public drinking water supplies were protected via ownership or conservation easement.[6] The study also reported that 39 percent of community water systems do not even own the sanitary protective radius (150 - 400 feet) around their wells.[7]

Manchester Water Works is not alone in having the foresight to protect its water supply watershed lands; many water systems in New Hampshire benefit from locating their sources in areas protected by the town (as in Concord, Gorham, and Hancock, to name a few), the state

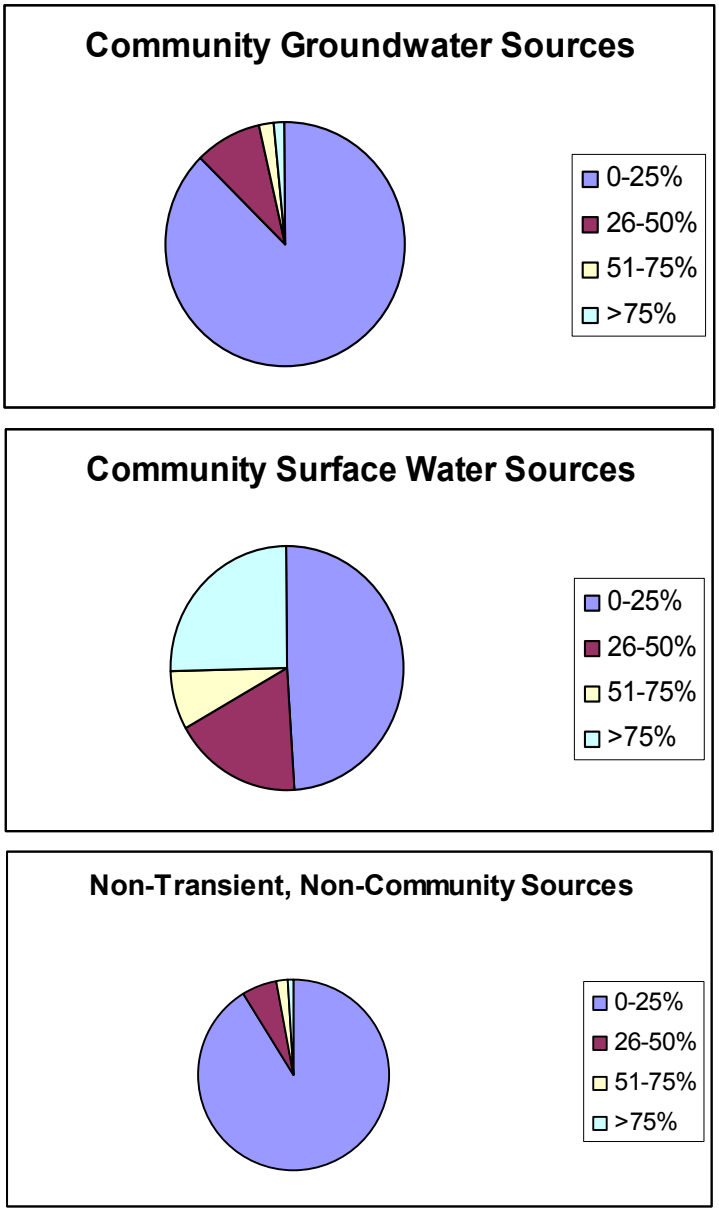
(Pembroke), the White Mountain National Forest (Bartlett, Berlin, Bethlehem, Jackson, Lancaster, Lincoln, and Littleton), and non-profit land conservation organizations (Troy).

Unfortunately, the vast majority of source water protection areas are largely, if not completely, unprotected. Figure 2 below shows the percentage of protected land in source water protection areas for three different types of public water supply sources: groundwater sources used by community systems; surface water sources used by community systems; and sources used by non-transient, non-community systems. (A community system serves year-round residents, while a non-transient, non-community system serves at least 25 of the same people each day in a non-residential setting. A school would be an example of an NTNC.)

Here, source water protection areas are the land that contributes to surface water bodies, such as a reservoirs or rivers, being used as public drinking water supply sources. This term also includes wellhead protection areas, the land that contributes to public water supply wells.

Figure 2 shows that approximately 90% of community groundwater sources and non-transient, non-community sources have 25% or less of their source water protection areas in conservation land, while 50% of community surface water sources have 25% or less of their source water protection areas in conservation land.

Figure 2
Percentage land protected in source water protection areas by different types of public water systems



B. WATER SUPPLY LAND GRANT PROGRAM DESIGN

In response to the need demonstrated by the 1998 SPNHF report, the New Hampshire Legislature created the Water Supply Land Grant Program in 2000, giving municipalities and non-profit water suppliers the opportunity to obtain grants for the purchase of land or conservation easements.

1. Statutory Requirements

RSA 486-A is the statute that establishes the N. H. Department of Environmental Services (DES) Water Supply Land Grant Program. Grants for the purchase of land or conservation easements are available to municipalities and non-profit organizations having water supply as their principal mission. The statute also provides that grants under the program cover up to 25 percent of total project costs, with 75 percent of the cost being matched by the entity requesting the grant. RSA 486-A:12 allows the applicant's 75% match to consist of:

- Cash;
- Transaction expenses, including associated legal and transaction costs;
- Donations of source water protection lands or conservation easements assessed at fair market value and protected in perpetuity; or
- A combination of cash, transaction expenses, and land donations.

RSA 486-A:2, II-a and RSA 486-A:7, II establish the following eligibility and application requirements for the program:

- The land or conservation easement must be from a willing seller and be within the source water protection area or wellhead protection area of an active or proposed public drinking water source;
- The source must supply a community or non-transient non-community water system;
- The land or conservation easement must be owned in perpetuity by the grantee;
- The land must be maintained in perpetuity to protect the drinking water source and no land use or development shall occur that would diminish the quality of the drinking water; and
- The applicant shall provide required stewardship, that is, ongoing surveillance of the land to ensure that the conservation intent is maintained, and submit annual stewardship reports to DES.

RSA 486-A:8 requires that DES establish rules governing the prioritization of applications and include the following factors:

- Distance from and relation to the drinking water source;
- Size of the area proposed for protection relative to size of the source water protection area;
- Natural resource values, including wetlands, habitat protection, and recreational uses;
- Current protection status of the source water protection area; and
- Ability of the applicant to pay for water supply land protection.

Finally, RSA 486-A:11 directs DES to adopt rules to implement the program and further describe requirements for eligibility determination and procedures and requirements for applications, project selection and prioritization, and stewardship. A copy of RSA 486-A can be found in Appendix A.

2. Eligibility requirements and application ranking and selection

The administrative rules that DES has adopted, Env-Ws 394, require that a project meet the following criteria in addition to the criteria set forth by the statute described above:

- The land or conservation easement must be within 5 miles of the water supply intake on a river or within 5 miles of the shore of a reservoir or lake used as a water supply source;
- The land being protected must be undeveloped and free of known and potential contamination sources;
- The project eligibility application must be approved by the local governing body of the municipality applying for the grant, where the applicant is a municipality; and
- The land to be protected must not already be permanently protected and not currently owned by the applicant.

The criteria DES uses to rank and select applications can be found at Env-Ws 394.11 and are summarized in Table 1 below.

TABLE 1 PRIORITIZATION FACTORS
Type of water system (NTNC, community, or municipal)
Size of water system (people served)
Status of water source (active or proposed)
Total percent of source water protection area that will be protected
Number of sources that will be protected
Size of the area proposed for protection (acres)
Natural resource values, including wetlands, habitat protection, and recreational uses
Distance from and relation to the drinking water source
Size of match over 75% provided by applicant
Number of water protection measures being implemented (e.g., educational program; water conservation plan; source water protection area regulations)
Average per capita income and equalized taxable valuation for the municipality where those served by the water supply reside

A complete list of the criteria and the scoring system is in Appendix B.

The administrative rules also set forth the application process for obtaining water supply land grants. There is a grant round in the spring and/or the fall depending on the availability of grant funds. The process consists of the following steps:

- Applicant submits a complete project eligibility application by the deadline announced by DES for that grant round.
- DES uses the information provided in these applications to determine which projects are eligible using the criteria in Env-Ws 394.05. DES then does a preliminary ranking of the projects using the priority ranking system in Env-Ws 394.11 and notifies

applicants within 30 days of the eligibility application deadline whether they are eligible and provides the results of the preliminary ranking.

- DES staff arrange with the applicants to visit the properties that have been conditionally selected to receive a grant.
- Applicants submit a final grant application package to DES by the deadline announced by DES for that grant round, typically two months after the eligibility application deadline.
- DES notifies applicants within 60 days of the final application deadline whether their project has been selected to receive a grant award pending Governor and Council approval. Governor and Council approval typically takes a minimum of one to two months.

3. Project completion and on-going stewardship

If the project is selected, the applicant must submit the following information for all properties to be protected under the application, including match properties:

- Property survey, prepared in accordance with Env-Ws 394.13;
- Appraisal, prepared in accordance with Env-Ws 394.14 and Env-Ws 394.15;
- Title examination, and if necessary, an opinion of title, prepared in accordance with Env-Ws 394.16; and
- Environmental site assessment, if necessary, prepared in accordance with Env-Ws 394.12.

Payment is not made until DES has approved these documents and approval of the project has also been obtained by the Attorney General's Office and the Governor and Council. The grantee is required to execute the land transaction and record the deed (Env-Ws 394.19), adhere to the terms of the conservation easement (Env-Ws 394.17), and provide ongoing stewardship of the property (Env-Ws 394.18).

4. Readoption and Revision of Rules

The current rules at Env-Ws 394 will expire on May 3, 2009. To prepare for readoption of the rules, DES staff are currently reviewing how the rules can be improved and will consult with stakeholders as part of this process. Among the revisions being considered are: assigning more ranking points to projects that are very close to the drinking water source being protected and assigning points if the project is initiated or strongly supported by the water supplier.

Appendix C contains a complete copy of Env-Ws 394. More information on the grant process, including applications and a copy of the rules, is available at http://www.des.state.nh.us/dwspp/acqui.htm or by calling Holly Green, Water Supply Land Grant Coordinator, at 271-3114.

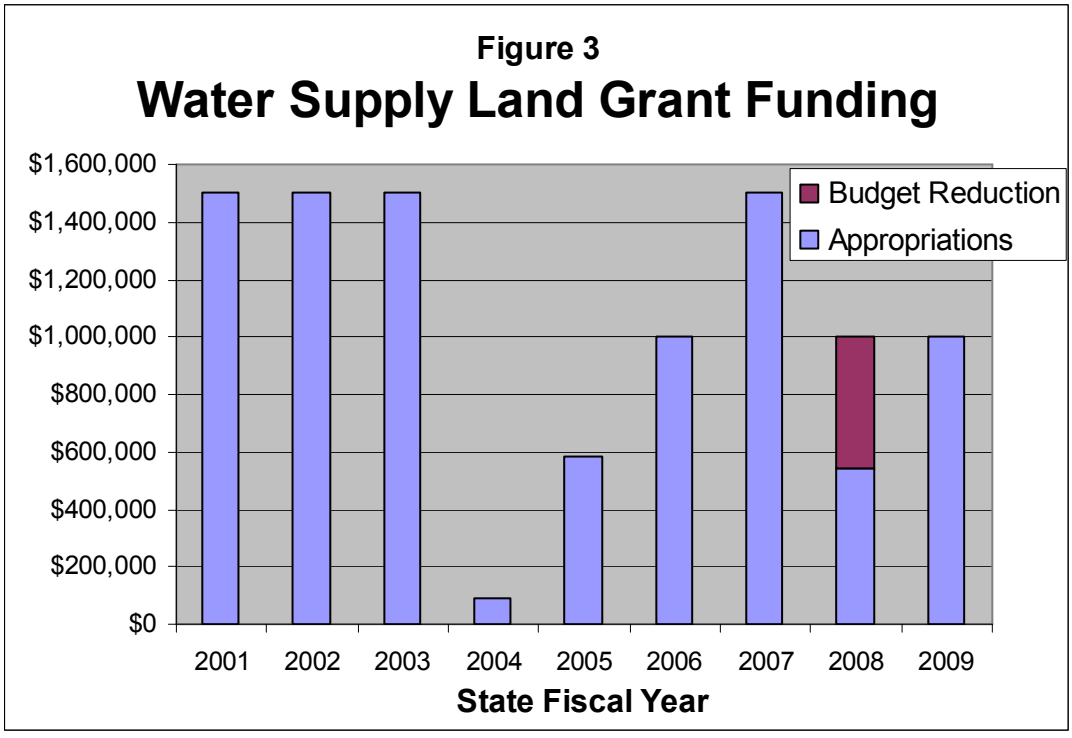
C. HISTORY OF THE LAND GRANT PROGRAM

1. Funding

The Water Supply Land Grant Program staff person is funded through a set-aside in the Drinking Water State Revolving Fund, which DES receives from the U.S. EPA pursuant to the Federal Safe Drinking Water Act. This makes it possible for all state funding provided for the Land Grant Program to be used solely for grants.

As indicated in Figure 3 below, the Legislature appropriated $1.5 million per year in the first few years of the program, but since then annual appropriations have ranged from less than $100,000 to $1.5 million, averaging $1,075,500 per year over the life of the program. In 2007, the legislature appropriated $1 million per year for Fiscal Years (FY) 2008 and 2009. However, budgetary reductions will result in only $542,750 of the FY 2008 funds being available for grant awards and the FY 2009 budget may be reduced as well.

Figure 3



2. Grant applications

The number of applications has increased since the early years of the grant program. In FY 2000, four eligibility and four final applications were received. In FY 2008, 13 eligibility and 10 final applications were received. Since 2003, grant requests have not only exceeded the funds available

each grant round, but the disparity between grant requests and the amount of funding available has continued to increase.

The geographic distribution of applications has become more widely dispersed throughout the state. In 2000 through 2005, applications were from municipalities in the southern region of the State. Since 2006, applications from other regions have steadily increased.

3. Collaboration with other organizations

From the beginning of the water supply land grant program to the present, the Society for the Protection of New Hampshire Forests (SPNHF) has been an important partner. It was SPNHF's 1998 study that highlighted the need for a grant program to assist municipalities in protecting their drinking water sources. From 2000 through 2004, DES contracted with SPNHF to provide valuable assistance in drafting, reviewing, and negotiating conservation easement deed language with applicants. Since that time, DES has continued to consult with SPNHF on conservation easement deed language and on cutting edge conservation issues.

Many organizations have been and continue to be important partners by assisting municipalities and/or contributing to municipalities' required 75% match. These partners include SPNHF, the USDA Natural Resources Conservation Service through its Farm and Ranch Protection Program and Wetlands Reserve Program, the Nature Conservancy, the Great Bay Resource Protection Partnership, the federal Coastal and Estuarine Land Conservation Program, the New Hampshire Fish and Game Department's Landowner Incentive Program, the New Hampshire Land and Community Heritage Investment Program, the Trust for Public Land, and a number of regional land trusts. There are also DES programs which have either provided match funding in the past or have the potential to provide funding in the future. These DES programs include the Wetlands Mitigation Fund and the Drinking Water State Revolving Loan Fund.

D. PROJECTS FUNDED FROM MAY 2005 THROUGH MAY 2008

1. Projects completed prior to May 2005

Projects completed prior to May 2005 are listed in Appendix D. Over the life of the program, grant awards have averaged $250,317 per project and acres protected with each project have averaged 224 acres. These projects are also described in more detail in the first and second water supply land grant program reports issued in 2003 and 2005 respectively.

2. Projects completed since the previous report

Grant awards since the date of the previous report (May 2005) through May 2008 are shown in Table 2 below in order of completion. From May 2005 through May 2008, a total of 928 acres was protected and $1,812,899.54 in water supply grant funds was awarded.

TABLE 2
WATER SUPPLY LAND GRANT PROJECTS COMPLETED MAY 2005 - MAY 2008

Municipality	Acres Protected and Type of Protection	Grant Amount % Match	Local Match % Match	Year Grant Awarded	Year Project Completed
Lee	62 acres; Conservation Easements on 46 acres and Deed Restrictions on 16 acres	$225,000 25%	$684,000 75%	2005	2006
Newfields	327 acres Conservation Easements	$331,994 4%	$7,949,806 96%	2006	2006
Orford	11 acres Deed Restrictions	$20,306.54 25%	$60,919.62 75%	2006	2006
Hopkinton	69 acres Conservation Easement	$173,750 25%	$521,250 75%	2006	2006
Durham	86 acres Conservation Easement	$235,000 25%	$705,250 75%	2005	2007
Rochester	23 acres Deed Restrictions	$200,000 21%	$757,667 79%	2005	2007
Barrington	98 acres Conservation Easement	$125,000 11%	$1,091,560 89%	2006	2007
Brentwood	92 acres Conservation Easements	$348,849 23%	$1,198,403 77%	2007	2008
Walpole	60 acres; Conservation Easement on 52 acres and Deed Restrictions on 8 acres	$153,000 24%	$497,000 76%	2007	2008
Total: Average:	**828 acres 92 acres**	**$1,812,899.54 $201,433.28 20%**	**$13,465,855.62 $1,496,206.18 80%**		

The following is a description of these projects in order of completion.


Mills property in Lee NH *photo credit: Richard Weyrick*

LEE (Five Corners Reserve and Garrity/Jenkins/Mills properties) – This project protects 21 acres of land in the wellhead protection area of one of the UNH/Durham wells and 41 acres of land in the source water protection area of UNH/Durham's Oyster River Intake. The UNH/Durham water system serves a population of 12,000.

Piscassic River along Piscassic Greenway
photo credit: Tim Gaudreau

Piscassic Greenway - Newfields & Newmarket NH
photo credit: Tim Gaudreau

NEWFIELDS (Piscassic Greenway) – This project protects 327 acres in the source water protection area of the Town of Newmarket's Lamprey River intake, which serves a population of 5,000. This land is also within the wellhead protection area of a community well for the Great Bay Water System, serving a population of 220.

ORFORD (Orford Village District) – Eleven acres of forest and fields were protected by this project. The land is within the wellhead protection area of the Orford Village District's new well, which serves a population of 125.

Ransmeier property - Hopkinton NH photo credit: Five Rivers Conservation Trust

HOPKINTON (Ransmeier property) – This project protects 69 acres of forest, fields, and wetlands within the wellhead protection area of the Hopkinton's Village Precinct wells, which serve a population of 215.

Fogg property-Durham NH photo credit: Chris Kane

DURHAM (Fogg property) – This project protects 86 acres of forest, fields, and wetlands located over the Spruce Hole aquifer and within the source water protection area of the UNH/Durham Lamprey River intake, which serves a population of 12,000. The property contains fifteen acres of open marsh that are the headwaters for Woodman Brook, which flows into the Lamprey River.

ROCHESTER (Round Pond property) – Twenty-three forested acres were protected near Round Pond, a water supply reservoir used by the City of Rochester, serving a population of 20,000. This land is also within the source water protection area of Rochester's Berry River intake, immediately adjacent to the Rochester Reservoir.

Borodavcuk Property - Barrington NH
photo credit: John Wallace

Bellamy River - Barrington NH

BARRINGTON (Borodavchuck property) - Ninety-eight acres of forests and wetlands were protected by this project. The land is located within the source water protection area of the Bellamy Reservoir, a drinking water supply for the City of Portsmouth, serving a population of 33,000.

BRENTWOOD (Powers/Poesse-Bertram properties) – This project protects 84 acres of forests and fields with extensive frontage on the Exeter River and within the source water protection area for the Exeter Water Department, which serves a population of 11,000. It also protects a 23-acre forested property in the same source water protection area. Five acres of this parcel are also in the wellhead protection area of a community public water system, Louisburg Circle, serving a population of 55.


Ballam Farm - Walpole NH *Ballam Farm - view of Connecticut River*
Photo credit: The Trust for Public Lands

WALPOLE (Ballam Farm) – Sixty acres of forest and prime farmland with extensive frontage on the Connecticut River were protected by this project. This land is within the wellhead protection area for the Walpole Water Department's River Well, a municipal water system serving a population of 922. The property boundary is 309 feet from the well site and abuts the Town's River Well property.

3. Projects pending as of May 31, 2008

The following projects received grant awards in 2006 and 2007 and have been approved by Governor and Council, but have not yet been completed. They are listed below in alphabetical order by municipality.


Cheney property in Lee NH *photo credit: Richard Weyrick*

LEE (Cheney property) – This project protects 43 acres in the source water protection area of UNH/Durham's Oyster River Intake, which serves a population of 12,000. The property includes a 15 acre former gravel pit in the final stages of reclamation and 28 acres of upland forest and wetlands with the Oyster River running through it.

Kelley property in Lee NH *photo credit: Richard Weyrick*

LEE (Kelley/Ford properties) – One hundred twenty-seven acres of forest, fields, and wetlands with extensive frontage on the Oyster River would be protected by this project. Seventy-two acres of the land, including a former gravel pit in the final stages of reclamation, are within the wellhead protection area for UNH/Durham's Lee Five Corners well. The closest edge of the property is 189 feet from this municipal well. All of the 127 acres are within the source water protection area for the Oyster River intake of the UNH/Durham water system, which serves a population of 12,000.

ROCHESTER (Maccabee property) – This project would protect a 38-acre forested property which has 1,000 feet of frontage on Pickerel Pond, a 10-acre undeveloped pond. This pond drains directly into the Berry River which flows into the Rochester Reservoir, which serves a population of 17,000. There are approximately 5 acres of high-value wetlands adjacent to the pond and part of larger wetland complex.

Spencer-Smith property in Wakefield NH *Lavender property-Pike Brook in Wakefield NH*
photo credit: Moose Mountains Regional Greenways

WAKEFIELD (Lavender/Spencer-Smith properties) – This project would protect 241 acres containing forest, fields, and a gravel pit in the later stages of reclamation within the wellhead protection area of two wells of the Sanbornville Water Department, a municipal water system serving a population of 1,500 in the Towns of Wakefield and Brookfield. The edge of the closest property is 200 feet from the wells. This project is a cooperative effort involving private landowners, two municipalities, the drinking water supplier, and two land trusts.


Blanchard and Rau properties in Windham NH *photo credit: James Finn*

WINDHAM (Blanchard/Rau properties) – This project would protect 84 acres of forest and wetlands partially within two community wellhead protection areas. Both properties are also within the source water protection area of the Salem Water Department, which serves a population of 18,000.

4. Applications pending as of May 31, 2008

For FY 2008, ten final applications requesting $1,169,647 were received and it is anticipated that nine projects will receive water supply land grants totaling $542,750. The funding requests for the City of Dover and the Town of Hooksett were approved by the Governor and Council on May 21, 2008 and the remaining requests are scheduled to be heard by the Governor and Council in June 2008. For the Fiscal Year 2008 grant round, grants will be awarded to the following projects pending Governor and Council approval prior to June 30, 2008. They are listed in descending order of ranking.

Misty Meadows Farm property in Lee NH *photo credit: Wendy Fogg*

LEE (Misty Meadows Farm) - This project would protect 66 acres of forest and farmland in the source water protection area for the UNH/Durham water system (Lamprey River and Oyster River), which serves a population of 12,000, and the source water protection area of Newmarket's Lamprey River source, serving a population of 5,000. The Lamprey River intake is just across Packer's Falls Road from the property. The land is also in the wellhead protection area for two community wells for The Inn at Spruce Wood, which serves a population of 95.

NEWMARKET (Smith property) - One hundred acres of forest, fields, and a former gravel pit would be protected in the wellhead protection area of two of Newmarket's municipal wells. The land is also within the source water protection area for Newmarket's Follet's Brook, Piscassic River, and Lamprey River intakes, serving a population of 5,000.

ROCHESTER (Smith property) - This project would protect 79 acres of forest, fields, and wetlands in Rochester's source water protection area for its drinking water supply, serving a population of 20,000. It is also within the wellhead protection area of two community wells for the Inn at Secretariat Estates, serving a population of 18.

Virginia Pond Trust property in Jaffrey NH *photo credit: Douglas Starr*

JAFFREY (Virginia Pond Trust property) - This project would protect 14 acres within the wellhead protection area for two of Jaffrey's wells, serving a population of 3,825. Engineering

and hydrogeological studies have shown that this site is also suitable for development of an additional water source.

CONCORD (Emmons property) - Forty-eight forested acres would be protected within the Penacook Lake watershed, which serves as a drinking water supply for the City of Concord, serving a population of 38,000. Concord has already protected a large area of land around the Lake and this parcel will expand that protection.

Clay pond property-Hooksett NH photo credit: Daniel Stern, Bear-Paw Regional Greenways

HOOKSETT (Clay Pond Headwaters) - This project would protect 81 acres of forest and extensive wetlands in the source water protection area for Manchester's drinking water supply, which serves a population of 133,000.

LeBrun property in Lebanon photo credit: Joan Monroe

LEBANON (LeBrun property) - This project would protect 23 acres of primarily farmland with frontage on the north side of Mascoma Lake, in close proximity to the Mascoma River, a drinking water source for the City of Lebanon, serving a population of 10,050. The land is also within the

wellhead protection area for two community wells, serving populations of 125 and 45 respectively.

DOVER (Frazer property) - This project would protect 24 acres overlying bedrock associated with Dover's future well location, which will serve a population of 28,000.

Farmington-LeClair property in Rochester *photo credit: John Wallace*

ROCHESTER (LeClair and Fernald properties in Farmington) - One hundred fifty-eight acres would be protected by this project. The land is in the source water protection area for Rochester's drinking water supply, serving a population of 20,000. The land is 1,430 ft from the shore of Round Pond and an intermittent stream runs through the properties into a wetland that feeds directly into the Pond.

E. PROGRAM OUTREACH

The purpose of the program's outreach efforts has been to maximize the program's effectiveness by encouraging the submission of applications for geographically diverse, high-quality projects.

Outreach consists of publicizing the program; providing potential applicants with information about the benefits of permanent protection of critical water supply lands, including the avoidance of remediation costs; and assisting prospective applicants with information regarding eligibility, scoring, and supplemental funding sources. Specifically, this is being done by:

- Posting information and announcements of grant availability on the DES web page;
- Distributing information packets to water system operators when DES staff perform sanitary surveys (on-site inspections of public water systems);
- Publishing information and announcements in DES Source Water Protection Program quarterly newsletters (distributed to water suppliers, conservation commissions, and planning boards); and

- Giving presentations and providing written materials at conferences and workshops.

With limited staff and budgetary uncertainty, additional outreach has been on an "as requested" basis. Extensive technical assistance is provided to applicants during the pre-application and application process, including printing maps upon request.

F. FUTURE GOALS

As evidenced by the program's experience to date, there is a continuing demand for funds to protect water supply lands, even when a 3:1 non-state match is required. However, in the larger picture of source water protection needs, the following goals have emerged:

1. Maximize the water quality protection value of grants

While the relationship between watershed development and water quality deterioration is well established, recent research has underscored the importance of protecting buffers of land adjacent to surface waters above other land in the watershed. A recent study in the State of Washington suggests that differences in riparian quality can explain much of the variation in stream response to watershed development. In streams with similar levels of development, *the streams with significant forested riparian areas tended to have healthier aquatic communities than those where the riparian buffer had been largely eliminated*."[8]

Data from New Hampshire support both the relationship between development and water quality and the importance of riparian buffers. In a study of ten small (avg. 2.8 sq. mi.) watersheds in the seacoast region, U.S. Geological Survey and the N.H. Coastal Program found a significant correlation between most water quality parameters and most measures of urbanization. Furthermore, "[t]he measures of urbanization that had the highest correlations with stream-quality variables were those measures that were associated with the percent of urban land in buffer zones near and upstream of a sampling site. . . Results from this study indicate that the percent of urban land use in buffer zones and the percent of impervious surface in a watershed can be used as indicators of stream quality."[9]

This understanding of the importance of riparian buffers suggests that the grant program could have a greater water quality protection impact by giving greater weight to the protection of buffers, perhaps by adjusting the application scoring system set out in the rules, Env-Ws 394.11.

2. Increase collaboration between municipal officials, staff, and water suppliers

Over the course of the program, some projects have had more collaboration and more involvement by the water supplier than others. Since land conservation is part of the overall strategy to protect a drinking water source, and because source water protection is the water supplier's responsibility, it is essential that water suppliers take a more active role in land conservation. Also, with municipal staff and officials juggling multiple responsibilities and stretched thin for both time and

money, it is important that water suppliers realize that they can not continue to rely on other municipal departments to be responsible for source water protection.

While it is desirable for water suppliers to take a more active role, other municipal officials should continue to be involved. Conservation commissions typically play an important role, for example, in negotiating with landowners and performing annual site visits to ensure that the provisions of the conservation easement or deed restrictions are complied with. Municipal staff can provide additional expertise and provide continuity that may be interrupted by turnover of volunteer conservation commission members. Municipal councils and selectmen can provide the leadership to emphasize that drinking water protection is an important priority.

Having all the potential players at the table – council members or selectmen; municipal administrators and planners; conservation commissioners; and water system owners and operators – will help ensure the success of water supply land conservation projects. DES will focus on outreach to municipalities to promote more collaboration between water suppliers and municipal staff and officials.

3. Improve stewardship monitoring

To date, the program's stewardship activities have been limited to reviewing monitoring reports submitted by grant recipients. Grantees are required to provide annual reports to DES describing their stewardship of the protected land and, as time permits, program staff have been taking steps to remind past grantees of their reporting responsibilities and to provide additional oversight.

Turnover of volunteers and lack of funds has created a challenge for some grantees in fulfilling their stewardship responsibilities. DES is considering ways to ensure continuity, for example, by placing a monitoring report requirement in the conservation deed. DES also hopes to begin field-checking easement compliance of past projects during 2008.

4. Revise land use restrictions to reflect the latest research

DES will continue to review and revise, as needed, the type and nature of restrictions that are in its conservation easement and deed restrictions templates. This continual review and modification is necessary to keep up with the latest research regarding the relationship between land uses and water quality. For example, studies are currently being performed to define the distance certain activities, such as livestock grazing, should be set back from surface water to ensure water quality protection.

G. SUGGESTED LEGISLATIVE CHANGES

DES has received feedback on a number of issues that would require legislative changes to the program. The three most frequently mentioned are presented here for consideration.

1. Protect future well sites

Development of water supply lands not only presents a cumulative risk to water quality; it also drastically reduces the availability of future well sites. Because new community wells must be located at least 150 to 400 feet (depending on the yield of the well) from existing development, any new development precludes the establishment of a community well within 150 to 400 feet of the site in the future. *As a consequence, nearly two-thirds of the 328 square miles of stratified-drift aquifers in New Hampshire capable of supporting a well yielding 75 gallons/minute or more are already* unavailable as future well sites - *not because of ownership, but because of nearby development.*[10]

Predictably, the situation tends to be worst in areas where water demand is likely to grow the most. While the focus of the Water Supply Land Grant Program has been on protecting existing public water supply sources and those future sources that have begun the new source approval process, the program does not address the need to protect the remaining undeveloped aquifers. To do so would require a change to RSA 486-A:2, III-a., "Eligible water supply land protection costs."

Legislation designed to protect future sources would help municipalities meet the growing demands for drinking water by their citizens as their populations continue to grow.

2. Increase flexibility regarding who may hold conservation easements

Since the inception of the grant program in 2000, municipalities have expressed concerns over their ability to enforce and monitor conservation easements. Landowners have also expressed a preference for land trusts to be the holder of the conservation easement on their land. However, since the statute requires that a grantee either own the land or be the holder of the conservation easement, allowing a land trust to be the easement holder of a property not owned by the grantee is not currently an option. Therefore, a statutory amendment to revise RSA 486-A:7, which currently reads, "The land shall be maintained in perpetuity, by a water supply land protection grantee," may be desirable.

Legislation that would to allow a municipality the option of having a land trust be the conservation easement holder would alleviate the cost to municipalities of providing stewardship of protected land.

3. Increase stability of funding source

The Water Supply Land Grant Program is funded by Legislative appropriations to the General Fund and this has led to vulnerability to budget cuts in times of budget shortfalls. The instability of funding has been discouraging to applicants, particularly when it has occurred in the middle of a grant round after applicants have put considerable time and money into a project. Legislation to provide a dedicated funding source for the Water Supply Land Grant Program would encourage more municipalities to invest in land conservation projects to protect their drinking water.

H. CONCLUSION

Land conservation continues to be an extremely effective way to protect drinking water quality. The Water Supply Land Grant Program has been successful in protecting 4,193 acres of critical water supply lands since its inception in June of 2000. The program has assisted and collaborated with municipalities, water suppliers, federal and state agencies, land trusts, and other conservation organizations as part of this protection effort.

Building on this success, DES is pursuing ways to improve the program, such as emphasizing the most critical water supply lands, particularly those close to water supply sources and their tributaries. DES will also seek to increase collaboration between water suppliers and municipal staff, to improve stewardship monitoring of protected lands, to increase the geographic distribution of projects, and to incorporate into the program the latest information regarding land conservation and water quality protection. As more is learned about what works, DES will continue to modify and improve its program, its requirements, and its outreach to maximize the drinking water quality benefits of the state funds invested in this program.

For additional information concerning New Hampshire's Water Supply Land Grant Program contact Holly Green, N.H. Department of Environmental Services, (603) 271-3114 or holly.green@des.nh.gov.

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